PENRITH
CITY COUNCIL

MAJOR ASSESSMENT REPORT

Application number:	DA21/0045
Proposed development:	Demolition Works & Land Remediation Works to Facilitate Proposed Penrith City Park
Property address:	134 - 138 Henry Street, PENRITH NSW 2750 144 Henry Street, PENRITH NSW 2750 140 - 142 Henry Street, PENRITH NSW 2750 46 Station Street, PENRITH NSW 2750 48 - 50 Station Street, PENRITH NSW 2750 42 - 44 Station Street, PENRITH NSW 2750
Property description:	Lot E DP 163176 Lot 1 DP 252457 Lot 1 DP 526304 Lot 10 DP 553665 Lot 11 DP 553665 Lot 2 DP 556075 Lot 3 DP 1200790 Lot 1 DP 164798
Date received:	28 January 2021
Assessing officer	Lucy Goldstein
Zoning:	Zone B4 Mixed Use - LEP 2010 RE1 Public Recreation - LEP 2010
Class of building:	N/A
Recommendations:	Approve

Executive Summary

Council is in receipt of a Development Application for Demolition Works and Land Remediation Works to Facilitate Proposed City Park at 134-144 Henry Street and 42-50 Station Street Penrith 2750.

The proposal seeks to demolish all existing buildings and pavement at the subject site, and subsequently undertake remediation works in order to prepare the site for its future use as a public park. A separate Development Application has been lodged with Council (DA20/0047) in relation to the site for the Construction and Embellishment of Penrith City Park including Amenities Building, Pergola Structures, Water Features, Seating, Lighting & Signage & Related Landscaping, Utility Servicing, Stormwater Management Infrastructure, Allen Place Car Park Modifications & Road Works.

Under the provisions of Penrith Local Environmental Plan 2010 (LEP), the subject site is zoned RE1 Public Recreation and B4 Mixed Use, and the proposal is defined as 'demolition and remediation works', which are permissible in the zone.

This application is to be determined by the Local Planning Panel as the subject site is owned by Penrith City Council.

As Penrith City Council is the land owner, the assessment of this application has been peer reviewed by an external planning consultant. The peer review, prepared by Landmark Planning, dated 13 April 2021 has considered Council's assessment report, the application and supporting documentation. The peer review concludes that the proposed works are permissible within the zone and that Council's assessment has suitably considered the key considerations of Section 4.15 of the Environmental Planning and Assessment Act 1979. Further, the peer review concludes that the provisions of State Environmental Planning Policy No.55- Remediation of Land have been suitability addressed, noting that remedial works are proposed via the accompanying Remedial Action Plan, which make the site suitable for the future planned recreational use of the site.

The application has been notified to nearby and adjoining properties and advertised in the local newspaper in accordance with Council's Community Engagement Strategy. Council received no submissions.

An assessment under Section 4.15 of the Environmental Planning and Assessment Act 1979 has been undertaken and the application is recommended for approval, subject to conditions.

Site & Surrounds

The Site

The development site ("the site") is located in Penrith's City Centre, being situated approximately 180m south of Penrith Railway station.

The site comprises of several adjoining allotments, including the following:

- Lot 1 in DP 164798 and Lot 1 in DP 252457, commonly known as 134 to 138 Henry Street
- Lot 10 and 11 in DP 553665, commonly known as 140 to 142 Henry Street
- Lot 2 in DP 556075, commonly known as 144 Henry Street
- Lot 3 in DP1200790, commonly known as 42 to 44 Station Street
- Lot 1 in DP 526304, commonly known as 48 to 50 Station Street
- Lot E in DP 163176, commonly known as 46 Station Street
- In addition, the site area includes portions of the Allen Place Car Park.

Penrith City Council is the landowner for all allotments as listed above.

On the site currently are several buildings, associated structures, pavement, and public car park. The site currently and has historically been used for a range of commercial purposes, including:

- Former dry cleaner at 134-138 Henry Street
- Commercial premises at 140 Henry Street
- Former funeral home at 42-44 Station Street
- Public car park, within the Allen Place Car Park

Surrounding Land Uses

The site is bound to the north by Henry Street and numerous commercial premises including a Gym, Queens of Hearts Community Foundation and Nepean College. Further north is an open carpark and commercial premises on Belmore Street, including Bob Jane T-Marts and Veterinary Hospital. To the east of the site is Woodriff Street North, followed by commercial premises and Edwards Place carpark. Further east a Pathology Centre and testing laboratory are present. The site is bound to the south by Allen Place, following which are multiple commercial properties including cafes, a medical centre and pharmacy. Beyond High Street commercial premises are present. The site is bound to the west by Station Street, then medium to high density commercial premises. Further to the west is Peach Tree Creek and eventually the Nepean River.

Proposal

The application seeks development consent for the following works:

- Demolition works across the extent of the subject site, including the removal of buildings, structures, and pavements;
- Following the completion of demolition works, remediation works will occur to excavate the extent of the site contamination and relocate contaminated materials within a controlled location for long term containment / encapsulation (containment cell located on the subject site).
- Proposed working hours are 7:00am to 6:00pm Monday to Friday, and 8:00am to 3:00pm Saturdays. No work is proposed on Sundays and Public Holidays.
- Retention and protection of an existing Corymbia sp (Corymbia) on the site, and retention of the feature fountain associated with the former Funeral Home.

The proposed demolition and remediation works are to facilitate the future Penrith City Park on the site. Noting that the construction and embellishment of the future City Park is subject to a separate, current development application (DA20/0047).

Plans that apply

- Local Environmental Plan 2010 (Amendment 4)
- Development Control Plan 2014
- State Environmental Planning Policy No 55—Remediation of Land

Planning Assessment

- ### Section 4.15 - Evaluation

  The development has been assessed in accordance with the matters for consideration under Section 4.15 of the Environmental Planning and Assessment Act 1979, and having regard to those matters, the following issues have been identified for further consideration:

Section 4.15(1)(a)(i) The provisions of any environmental planning instrument

State Environmental Planning Policy No 55—Remediation of Land

The proposal has been assessed against relevant criteria under State Environmental Planning Policy No 55- Remediation of Land (SEPP 55). The objective of SEPP 55 is to provide for a Statewide planning approach to the remediation of contaminated land.

The application seeks development consent for remediation works. Accordingly, the proposal and accompanying documentation has been assessed by Council's Environmental Management Officer. Based on this review, the proposed remediation works are considered acceptable subject to conditions, as summarised below:

The site has historically been used for a variety of commercial uses including dry-cleaning and retail fuel dispensing, followed more recently by light commercial land uses. As a result of these previous uses, remediation is required to make the land suitable for the future use of the site as a public park.

A number of contaminated land investigations have been undertaken on the site including extensive soil, groundwater, and vapour analysis. The investigations have identified the following areas of environmental concern:

- (AEC) as requiring remediation:
- AEC 1:Former Dry Cleaner Shop
- AEC 2: Former Service Station
- AEC 3 : Soils underlying transformers
- AEC 4: Unknown fill material underlying buildings and pavement

On the site currently are several commercial buildings and public car parking, all of which are proposed to be demolished. Remediation of the entire site is to be staged, guided by stage specific Remedial Work Plans (RWP's). This application relates specifically to the western portion of the site where remediation will render the site suitable for the proposed park area.

All of the works, including additional investigation works that are to be undertaken once buildings are demolished, will be supervised by a NSW EPA Accredited Site Auditor (Site Auditor) with all investigation, remediation and validation reports and management plans to be reviewed and endorsed by the Site Auditor. No work, other than remediation works, will occur on the site until a Site Audit Statement and Site Audit Report has been issued for the site (to be submitted and approved by Council).

The stage specific Remedial Work Plans (including the RWP for the western portion park area subject to this application) are guided by an 'Overarching Remedial Action Plan' that has been endorsed by the Site Auditor. The overarching remediation strategy is to make the site suitable for the planned Penrith City Park development through a mix of both offsite disposal of contaminated material and onsite containment of contaminated material. This remediation strategy has been chosen after extensive consideration of available technologies and options and is consistent with contaminated land guidelines in terms of criteria to be met as well as in terms of the best option having regard for public

Contaminated materials assessed as suitable for onsite retention will be excavated and consolidated prior to final placement within an onsite containment cell. The containment cell will be located at least 30m away from current and future on and offsite structures and will be located above the groundwater table. In addition, the containment cell will be capped ensuring that the capping layer is of adequate depth (1.0m), impermeable and appropriately covered with an identifying 'marker layer'. A Long-Term Environmental Management Plan will be developed for the site which will be endorsed by the Site Auditor. An 88B Restriction as to User will be applied to the site to ensure appropriate ongoing notification and management mechanisms are implemented. These matters are satisfactorily addressed in the documentation supporting the application and are reinforced through conditions of consent.

In conclusion, with consideration to the above the proposal is considered to meet the requirements under SEPP 55 in that suitable remediation works are proposed to make the site suitable for the future intended use of the site. Council's Environmental Management Officer has reviewed the application and all supporting documentation and raises no objections to the proposal subject to conditions.

Local Environmental Plan 2010 (Amendment 4)

Provision	Compliance
Clause 2.3 Permissibility	Complies - See discussion
Clause 2.3 Zone objectives	Complies - See discussion
Clause 2.7 Demolition requires development consent	Complies - See discussion
Clause 5.10 Heritage conservation	Complies - See discussion

Clause 2.3 Permissibility
Under the provisions of Penrith LEP 2010 the subject site is zoned RE1 Public Recreation, and B4 Mixed Use. The proposal is defined as demolition and remediation works, which are permissible uses in the RE1 Public Recreation and B4 Mixed Use zone.

It is noted that the proposal is to facilitate the future use of the site as a public park (subject to a separate development application), and a *'recreation area'* is a permissible land use on the site.

Clause 2.3 Zone objectives
The objectives of the RE1 Public Recreation zone are as follows:

- *To enable land to be used for public open space or recreational purposes.*
- *To provide a range of recreational settings and activities and compatible land uses.*
- *To protect and enhance the natural environment for recreational purposes.*
- *To ensure that development is secondary and complementary to the use of land as public open space, and enhances public use, and access to, the open space.*
- *To provide land for the development of services and facilities by public authorities for the benefit of the community.*

The proposal is considered to be consistent with the zone objectives as outlined above, in that the proposal will enable the future use of the site as a public recreational space for the benefit of the community.

The objectives of the B4 Mixed Use zone are as follows:

- *To provide a mixture of compatible land uses.*
- *To integrate suitable business, office, residential, retail and other development in accessible locations so as to maximise public transport patronage and encourage walking and cycling.*
- *To minimise conflict between land uses within the zone and land uses within adjoining zones.*
- *To create opportunities to improve public amenity.*
- *To provide a wide range of retail, business, office, residential, community and other suitable land uses.*

The proposal is considered to be consistent with the zone objectives as outlined above, in that the proposal is to prepare the site for the future use of a public park which is located close to public transport (approximately 180m from Penrith Railway), and will create opportunity to improve public amenity.

With consideration to the above, the proposal is considered consistent with the zone objectives.

Clause 2.7 Demolition requires development consent
Clause 2.7 requires that:

The demolition of a building or work may be carried out only with development consent.

In accordance with this Clause, the current application seeks development consent for the demolition of existing buildings, structures and pavement on the subject site.

Clause 5.10 Heritage conservation

There are three listed heritage items in the vicinity of the proposed works, comprising of the following buildings:

1. Penrith Council Chambers (former) (Penrith Local Environmental Plan [LEP] 2010 Item No. 189) located to the north of the subject site.
2. TAFE Building (Penrith LEP 2010 Item No. 689) located to the north-east of the site.
3. Prospect Electricity Building (former) (Penrith LEP 2010 Item No. 701) located to the north-east of the site.

Further, there is one unlisted potential heritage item on the subject site being the John Price & Son Funeral Home (former), which is proposed to be demolished as part of this application.

Accordingly, the proposal was supported by a City Park Penrith Non-Aboriginal Heritage Impact Statement (HIS), prepared by Artifact Heritage Services Pty Ltd, dated 27 January 2021, which assesses potential heritage impacts as a result of the proposal.

The submitted HIS concludes that the proposal will have varying impact on the surrounding listed heritage impacts, ranging from neutral to minor direct and indirect impacts. The proposal however will have major direct impact (demolition) of the unlisted item being the John Price & Son Funeral Home.

Given the neutral to minor impact of the development on the surrounding listed heritage items, and noting that the demolition works are proposed in order to enable a future public park as a recreational area, on balance the proposed demolition is considered acceptable, subject to compliance with the provided recommendations contained within the HIS. The key recommendations contained within the HIS include (but not limited to):

- requiring comprehensive photographic archival recording of the interiors and exteriors of the John Price & Son funeral home in accordance with relevant Heritage Division's guidelines should be conducted prior to demolition of the building. The photographic archival recording of each item would be carried out prior to works commencing, and in some cases, during the construction program. It should be prepared in accordance with the NSW Heritage Office's How to Prepare Archival Records of Heritage Items (1998), and Photographic Recording of Heritage Items Using Film or Digital Capture (2006) by a suitably qualified heritage consultant using archival quality material.

- The ornamental octagonal fountain from the John Price & Son funeral home must be retained in situ and protected during works, and form part of the park landscaping following the completion of works.

- The stained glass windows and Chromatex bricks from the John Price & Son funeral home should be salvaged during demolition works.

- During construction and demolition works, monitoring of vibration impacts to the locally significant former Council Chambers (Penrith LEP 2010 Item No. 189), TAFE Building (Penrith LEP 2010 Item No. 689) and former Prospect Electricity Building (Penrith LEP 2010 Item No. 701) would be undertaken by structural engineers or a vibration specialist.

The application and supporting documentation was reviewed by an independent Heritage Consultant, who in principle did not support the demolition of the unlisted item, however they provided recommended conditions, which have been included in this report.

Overall, on balance the proposal is considered acceptable subject to conditions, recognising that the demolition works are to prepare the site for the use of a future public park, which is considered to be in the public interest, and the future development (public park) will have neutral to minor impact on the three surrounding listed heritage items.

Section 4.15(1)(a)(iii) The provisions of any development control plan

Development Control Plan 2014

Provision	Compliance
C1 Site Planning and Design Principles	N/A
C2 Vegetation Management	Complies - see Appendix - Development Control Plan Compliance
C3 Water Management	Complies
C4 Land Management	Complies - see Appendix - Development Control Plan Compliance
C5 Waste Management	Complies - see Appendix - Development Control Plan Compliance
C6 Landscape Design	N/A
C7 Culture and Heritage	Complies
C8 Public Domain	Complies
C9 Advertising and Signage	N/A
C10 Transport, Access and Parking	Complies - see Appendix - Development Control Plan Compliance
C11 Subdivision	N/A
C12 Noise and Vibration	Complies
C13 Infrastructure and Services	Complies
E11 Penrith	Complies - see Appendix - Development Control Plan Compliance

Section 4.15(1)(b)The likely impacts of the development

Environmental Impacts (Odor, Dust, Water Quality, Noise)

The proposal has potential to cause negative impacts, including odour, dust, water quality and noise impacts. To mitigate potential adverse impacts, various management plans have been prepared, and further plans will be developed as required by conditions of consent. All management plans are to be endorsed by the Site Auditor and will ensure the implementation of appropriate management controls, including monitoring, to mitigate potential human health and environmental impacts.

Existing Tree Retention and Protection Measures

Currently on the southern edge of the site is a large, well established Corymbia sp (Corymbia). This tree is proposed to be retained, and incorporated into the landscape design of the future City Park. A condition of consent has been imposed requiring the retention of the Corymbia sp (Corymbia). Further, conditions have been imposed requiring tree protection measures to be undertaken before and during demolition and remediation works, to ensure the ongoing health and viability of this tree. These conditions have been recommended as per advice from Council's Tree Management Officer.

Engineering (Flooding)

The site is affected by 1% AEP local overland flow flooding based on the *Penrith CBD Detailed Overland Flow Flood Study, 2015,* and *Penrith CBD Floodplain Risk Management Study and Plan, 2020*. However, given that the application is for demolition and remediation works only, the proposal is considered consistent with Council's flooding controls, subject to ensuring that any overland flows are not concentrated, dammed or diverted onto adjoining properties or Council's road network as a result of the works. A condition of consent to this effect has been imposed.

The site is further affected by mainstream flooding from the Nepean River in a Probable Maximum Flood (PMF) event. However, given the nature of the proposed development, flood related planning controls do not apply in this instance. It is noted that Council's Development Engineer raised no objections to the proposal, subject to recommended conditions of consent.

Traffic

To ensure the proposal does not result in adverse traffic impacts as a result of works, noting the considerable scale of demolition works, a condition of consent has been imposed requiring that prior to the commencement of any demolition or remediation works, a Construction Traffic Management Plan (CTMP) to be submitted to and approved by Penrith City Council’s Asset Management Department. The CTMP is to be prepared by a suitably qualified consultant with appropriate training and certification from Transport for NSW, and include details of any required road closures, work zones, loading zones and the like. Noting that approval of the CTMP may require endorsement by Council's Local Traffic Committee.

Section 4.15(1)(c)The suitability of the site for the development

The site is considered suitable for the proposal. In this regard, the proposal is a permissible land use, will result in the remediation of land, and facilitate the future use of the site as a public park.

Section 4.15(1)(d) Any Submissions

Community Consultation

In accordance with Council's Community Engagement Strategy, the proposal was notified to nearby and adjoining properties.

Council notified fifty-nine residences in the area, and the exhibition of the proposal occurred between 22 February to 23 March 2021

The application was also advertised in a local newspaper on 18 February 2021.

Council received no submissions.

Referrals

The application was referred to the following stakeholders and their comments have formed part of the assessment:

Referral Body	Comments Received
Development Engineer	No objections - subject to conditions
Heritage	Not supported, however conditions provided
Environmental - Environmental management	No objections - subject to conditions
Traffic Engineer	No objection subject to conditions

Section 4.15(1)(e)The public interest

The proposal is not considered to generate any significant issues of public interest, noting the nature of the proposal and that no submissions were received in relation to the application.

Conclusion

In assessing this application against the relevant environmental planning policies, being State Environmental Planning Policy No.55- Remediation of Land, Penrith Local Environmental Plan 2010, and Development Control Plan 2014, the proposal satisfies the aims, objectives and provisions of these policies.

Overall, the proposal is considered to be in the public interest as the demolition and remediation works will facilitate the future use of the site as a public park within the Penrith City Centre. The proposal is unlikely to result in negative impacts, noting that conditions of consent have been recommended relating to minimising environmental impacts (including odour, noise, dust and heritage impacts), ensuring the retention and protection of an existing tree on the site, and requiring a construction traffic management plan.

In conclusion, the application is recommended for approval, subject to the following conditions.

Recommendation

That Development Application DA21/0045 for Demolition Works and Land Remediation Works to Facilitate Proposed City Park at 134 - 144 Henry Street and 42-50 Station Street Penrith 2750 be approved subject to the attached conditions (Development Assessment Report Part B).

General

1 A001 - Approved plans table

The development must be implemented substantially in accordance with the Statement of Environmental Effects prepared by JBS&G, Reference 58140/134529 (Rev A), dated 14 December 2020, the application form, and any supporting information received with the application, except as may be amended by the following conditions.

Demolition

2 B002 - Demolition and Disposal to Approved Landfill Site

All demolition works are to be conducted in accordance with the provisions of AS 2601-1991 “The Demolition of Structures” and the Hazardous Building Materials Survey (Ref: 58140/127,994 Rev 0) prepared by JBS&G Australia Pty Ltd and dated 18 March 2020.

Prior to demolition, all services shall be suitably disconnected and capped off or sealed to the satisfaction of the relevant service authority requirements.

All demolition and excavated material shall be disposed of at a lawful waste management facility.

3 B006 - Hours of work

Demolition and remediation works will be restricted to the following hours in accordance with the NSW Environment Protection Authority Noise Control Guidelines:

- Mondays to Fridays, 7am to 6pm
- Saturdays, 7am to 1pm (if inaudible on neighbouring residential premises), otherwise 8am to 1pm
- No work is permitted on Sundays and Public Holidays.

In the event that the demolition or remediation work does not involve the use of equipment that emits noise then the work is not restricted to the hours stated above.

The provisions of the Protection of the Environment Operations Act, 1997 in regulating offensive noise also apply to all works.

Heritage/Archaeological relics

4 C Special - Archival

Prior to the commencement of demolition works, the Funeral Home Building located at 42-44 Station Street is to be archivally recorded, including its building exterior and interior. The archival recording is to be prepared by a suitably qualified heritage consultant using archival quality material and prepared in accordance with 'NSW Heritage Office’s How to Prepare Archival Records of Heritage Items' (1998), and ' Photographic Recording of Heritage Items Using Film or Digital Capture' (2006).

Prior to the commencement of demolition works, a copy of the archival record as required by this condition is to be provided to Council's library.

5 C Special - Fountain must be retained

The fountain located at the corner of Station and Henry Street that is associated with the Funeral Home building must be preserved in situ.

6 C Special - Heritage

The development is to be carried out in accordance with the recommendations of the 'City Park Penrith Heritage Impact Statement' prepared by Artefact Heritage Services Pty Ltd, dated 27 January 2021, in so far as the recommendations relate to the subject development.

Environmental Matters

7 D001 - Implement Approved Sediment and Erosion Control Measures

Erosion and sediment control measures shall be installed **prior to the commencement of works on site.** The erosion and sediment control measures are to be maintained in accordance with the approved erosion and sediment control plan(s) for the development and the Department of Housing's “Managing Urban Stormwater: Soils and Construction” 2004.

The approved sediment and erosion control measures are to be maintained until development of the site has been completed including all building and landscaping work to occur post remediation of the site. These measures shall ensure that mud and soil from vehicular movements to and from the site does not occur.

8 D - Dust

Offensive odours are not to be emitted from the site. Vapours, fumes, gases, particles or any other substance that are considered to be harmful to human health or the environment or impact unreasonably on a person outside of the premises are not to be emitted from the site.

9 D Special - 88B Instrument

Upon submission to Penrith City Council of the NSW EPA Accredited Site Auditor prepared Site Audit Statement and Site Audit Report, including the Environmental Management Plan, the applicant shall submit to Council for approval, an 88B instrument which includes a restriction as to user over the subject site, with Council being the beneficiary. The restriction shall contain the following wording (or wording to the effect and as appropriate):

1. There is soil contamination on the land. Any risks from the presence of that contamination should be assessed prior to undertaking development on the land or changing the use of the land.
2. This land is the subject of an Environmental Management Plan prepared by ##### , dated ##### that contains specific requirements in relation to managing activities on this land.
3. The Environmental Management Plan refers to areas of residual soil contamination and on-site management of contaminated material (specify, asbestos and other contaminants) that must not be excavated without obtaining an environmental assessment report. Excavation works may also require the consent of Council.

Following approval by Council and within six (6) months of submission of the Site Audit Statement and Site Audit Report, the restriction must be registered with the Land & Property Management Authority in accordance with Section 88B of the *Conveyancing Act 1919*.

10 D Special - Environmental Management Plan

The Council approved and NSW EPA Accredited Site Auditor endorsed Environmental Management Plan (EMP) for the ongoing management of the site is be implemented and complied with. Should the document be amended at any time, a copy of the revised EMP shall be submitted to Council.

11 D Special - No Encroachment/ Impact on the Containment Cell

No services, infrastructure or building components other than the structural components required for the construction of the containment cell, are to traverse or impact the containment cell.

12 D special - Noise Impacts

Works shall be carried out in accordance with the *NSW Department of Environment and Climate Change’s “Interim Construction Noise Guideline” 2009* and the *Construction Noise & Vibration Management Plan City Park Penrith prepared by Acoustic Dynamics and dated 11 December 2020.*

13 D Special - Remediation Documentation

Site remediation works shall be carried out generally in accordance with the following Council approved and NSW EPA Accredited Site Auditor endorsed documents:

- Penrith Central Park Village Overarching Remedial Action Plan (Overarching RAP) (Ref:55073/120362 Rev 0) prepared by JBS&G Australia Pty Ltd and dated 5 March 2019
- Draft Remedial Work Plan (RWP) Penrith Central Park Village Ref:58410/132003 Rev B prepared by JBS&G Australia Pty Ltd and dated 8 December 2020 (as well as final version RWP and additional RWPs developed as works progress and as endorsed by Site Auditor)
- Hazardous Building Materials Survey (Ref: 58140/127,994 Rev 0) prepared by JBS&G Australia Pty Ltd and dated 18 March 2020
- Penrith Central Village Park Remediation Works Construction Environmental Management Plan (Ref: 58140/123808 Rev A) prepared by JBS&G Australia Pty Ltd and dated 14 December 2020
- Health and Safety Plan
- Site Auditor Interim Advice
- Environmental Management Plan

as well as Penrith Development Control Plan 2014, applicable NSW Environment Protection Authority made and endorsed Guidelines (including the Contaminated Land Management Guidelines for the NSW Site Auditor Scheme (3rd edition) 2017), the National Environment Protection (Assessment of Site Contamination) Measure 1999 [NEPM2013] and ANZECC and NHMRC Guidelines.

The above documents may be revised, updated and additional plans developed as required throughout the remediation works. As the plans and documents are updated and new plans or documents developed, a copy of the Site Auditor endorsed plans/documents (including Site Auditor Interim Advice) are to be provided to Penrith City Council.

14 D special - Remediation Works Approvals

No remediation works are to commence until:

(a) the remaining pre-remediation investigations have been completed and endorsed by the NSW Accredited Site Auditor and the Draft Remedial Work Plan (RWP) has been finalised and endorsed by the Site Auditor; and

(b) the Site Auditor endorsed RWP has been submitted to and approved by Penrith City Council.

15 D special - Supervision of Remediation Works

All remediation works, including all associated investigation and validation works, are to be supervised by an appropriately qualified person. An appropriately qualified person is defined as a person who, in the opinion of Council, has a demonstrated experience, or access to experience in hydrology, environmental chemistry, soilscience, eco-toxicology, sampling and analytical procedures, risk evaluation and remediation technologies. In addition, the person will be required to have appropriate professional indemnity and public risk insurance.

The appropriately qualified person/s shall:

(a) Supervise the remediation works
(b) Supply Council with a copy of any relevant documentation for further testing carried out during the remediation works
(c) After completion of works, provide Council with a Site Auditor endorsed Validation Report, Environmental Management Plan and other documents as required. The Validation Report is to include Survey Plan(s)/Works-as-Executed Plan showing the location and extent of the containment of contaminated material (containment cell).

A NSW EPA Accredited Site Auditor (as accredited under the Contaminated Land Management Act 1997) shall supervise the remediation works, including all associated investigation and validation works.

A Site Audit Statement and Site Audit Report must be submitted to Penrith City Council on completion of the remediation and validation works and prior to any other works commencing on the site. The site must be suitable for its intended land use and shall not pose any unacceptable risk to human health or the environment.

The contact details of the appropriately qualified person/s, and the NSW EPA Accredited Site Auditor, engaged for the works, shall be provided with the Notice of Commencement.

Construction

16 H001 - Stamped plans and erection of site notice

Stamped plans, specifications, a copy of the development consent, the Construction Certificate and any other Certificates to be relied upon shall be available on site at all times during construction.

The following details are to be displayed in a maximum of 2 signs to be erected on the site:

- the name of the Principal Certifying Authority, their address and telephone number,
- the name of the person in charge of the work site and telephone number at which that person may be contacted during work hours,
- that unauthorised entry to the work site is prohibited,
- the designated waste storage area must be covered when the site is unattended, and
- all sediment and erosion control measures shall be fully maintained until completion of the construction phase.

Signage but no more than 2 signs stating the above details is to be erected:

- at the commencement of, and for the full length of the, construction works onsite, and
- in a prominent position on the work site and in a manner that can be easily read by pedestrian traffic.

All construction signage is to be removed when the Occupation Certificate has been issued for the development.

17 H002 - All forms of construction

Prior to the commencement of works:

(a) Toilet facilities at or in the vicinity of the work site shall be provided at the rate of one toilet for every 20 persons or part of 20 persons employed at the site. Each toilet provided must be:

- a standard flushing toilet connected to a public sewer, or
- if that is not practicable, an accredited sewage management facility approved by the council, or
- alternatively, any other sewage management facility approved by council.

(b) All excavations and backfilling associated with the erection or demolition of a building must be executed safely and in accordance with the appropriate professional standards. All excavations associated with the erection or demolition of a building must be properly guarded and protected to prevent them from being dangerous to life or property.

(c) If an excavation associated with the erection or demolition of a building extends below the level of the base of the footings of a building on an adjoining allotment of land, the person causing the excavation to be made:

- must preserve and protect the building from damage, and
- if necessary, must underpin and support the building in an approved manner, and
- must, at least 7 days before excavating below the level of the base of the footings of a building on an adjoining allotment of land, give notice of intention to do so to the owner of the adjoining allotment of land and furnish particulars of the excavation to the owner of the building being erected or demolished. The owner of the adjoining allotment of land is not liable for any part of the cost of work carried out for the purposes of this condition, whether carried out on the allotment of land being excavated or on the adjoining allotment of land, (includes a public road and any other public place).

(d) If the work involved in the erection or demolition of a building is likely to cause pedestrian or vehicular traffic in a public place to be obstructed or rendered inconvenient, or involves the enclosure of a public place, a hoarding or fence must be erected between the work site and the public place:

- if necessary, an awning is to be erected, sufficient to prevent any substance from, or in connection with, the work falling into the public place,
- the work site must be kept lit between sunset and sunrise if it is likely to be hazardous to persons in the public place, and
- any such hoarding, fence or awning is to be removed when the work has been completed.

Engineering

18 K201 - Infrastructure Bond

An Infrastructure Restoration Bond is to be lodged with Penrith City Council for development involving works around Penrith City Council's Public Infrastructure Assets. The bond is to be lodged with Penrith City Council prior to commencement of any demolition or remediation works. The bond and applicable fees are in accordance with Council’s adopted Fees and Charges.

An application form together with an information sheet and conditions are available on Council’s website.

Contact Penrith City Council's Asset Management Department on 4732 7777 or visit Penrith City Council’s website for more information.

19 K202 - S138 Roads Act - Minor Works in the Public Road

Prior to the commencement of any demolition or remediation works, a Section 138 Roads Act application, including payment of application and inspection fees together with any applicable bonds, shall be lodged with and approved by Penrith City Council (being the Roads Authority for any works required in a public road). These works may include but are not limited to the following:

a) Demolition or remediation works within the road reserve
b) Road occupancy or road closures (including temporary construction work zones and tower crane operation)
c) The placement of hoardings, structures, containers, waste skips, signs etc. in the road reserve
d) Temporary construction access

All works shall be carried out in accordance with the Roads Act approval, the development consent, including the stamped approved plans, and Penrith City Council's specifications, guidelines and best engineering practice.

Contact Penrith City Council's Asset Management Department on 4732 7777 or visit Penrith City Council's website for more information.

20 K224 - Construction Traffic Management Plan

Prior to the commencement of any demolition or remediation works, a Construction Traffic Management Plan (CTMP) shall be submitted to Penrith City Council's Asset Management Department for endorsement. The CTMP shall be prepared by a suitably qualified consultant with appropriate training and certification from Transport for NSW. The CTMP shall include details of any required road closures, work zones, loading zones and the like. Approval of the CTMP may require approval of the Local Traffic Committee. Please contact Council's Asset Management Department on 4732 7777 and refer to Council's website for a copy of the Temporary Road Reserve Occupancy Application Form.

21 K Special Condition - Overland Flows

The demolition and remediation works shall not concentrate, dam or divert overland flows onto adjoining properties or Council's road network.

Landscaping

22 L010 - Retain existing tree

The existing Corymbia sp (Corymbia) on the site is to be retained.

23 L Special - Engagement of Arborist

An Arborist with a minimum AQF (Australian Qualification Framework) Level 5 shall be engaged for the duration of the approved works to ensure that tree protection measures on the site are implemented and complied with.

The project Arborist is to ensure that demolition can be undertaken in such a way that machinery will not be required to enter into the designated Tree Protection Zone (TPZ) and so that building debris does not fall into the TPZ of the Corymbia sp (Corymbia) located on the southern boundary. In the event that remediation works are required to be undertaken within a distance of 15m from the existing Corymbia sp (Corymbia), the project Arborist must be consulted in regards to those works.

24 L Special - Tree Protection Measures

Prior to the commencement of works, a Tree Protection Plan (Specification) and Drawing written in accordance with AS 4970 - 2009, 'Protection of Trees on development sites' is to be prepared, to appropriately retain and protect the Corymbia sp (Corymbia) located on the southern boundary. of the site, and be submitted to and approved by Penrith City Council.

At a minimum the following protection measures of the plan shall include but not be limited to:

- providing a Tree Protection Area of at a distance of 15 metres to the north; and as bounded by the current curb edge to the east and west; and as bounded by the curb to the south;

- ensuring that the existing road surface and small garden bed are retained within this perimeter. This surface is not to be removed as part of this approval;
- ensuring the fencing to be installed is constructed of wooden panels, palings or the like to prevent soil and debris encroaching into the TPZ as detailed in *AS 4970 - 2009, Protection of Trees on development sites, Section 4.3*;
- providing for weather resistant signage in a prominent locations on the tree protection fence that indicates access into the Tree Protection Zone is not permitted. The sign shall be a minimum dimension of 500mm high x 400mm wide of similar design and layout as per *Appendix C, AS4970 - 2009 Protection of trees on development sites*
- ensuring the fence is installed prior to the commencement of demolition;
- requiring the project Arborist to supervise any work within or directly adjacent to the Tree Protection Zone;
- requiring the project arborist to undertake regular inspections to ensure the fence is intact, complies with the above standard, is installed to the appropriate dimensions and provides effective protection for the tree to be retained.
- ensuring the Tree Protection Zone (TPZ) is maintained as per *AS4970 - 2009, Section 4.6.* Access to the TPZ is permitted to undertake necessary maintenance such as mowing, watering & weed control;
- ensuring building materials, chemical storage, site sheds, wash out areas, and similar shall not be located within the fenced Tree Protection Zone or that the Tree protection Zone is not downstream of any washdown areas.
- Providing a contingency should tree roots be exposed during approved works to permit roots with a diameter less than 25mm to be pruned cleanly using sharp hand tools and not torn or ripped by machinery and require tree roots greater than 25mm in diameter are to be assessed by a qualified arborist - minimum Australian Qualification Framework (AQF) Level 5 or equivalent – before any pruning work is undertaken.

The Tree protection Plan (Specification) and Drawing is to:

- require that the Corymbia sp (Corymbia) located on the southern boundary and the location of the tree protection fence be marked on all demolition and construction drawings.
- provide a requirement that all contractors and workers on site shall be briefed on the tree protection and management procedures in place as part of their site induction. A written record of the induction process is to be kept on site.
- identify key stages where monitoring and certification will be required as outlined in AS 4970–2009, Section 5;
- require the project Arborist to supervise any work within or directly adjacent to the Tree Protection Zone;
- nominate whether trunk and branch protection will be required to be installed on the tree and at what stages this may be required;
- permit the project Arborist to alter/adjust the Tree Protection Zone or measures providing that reasons for this are clearly documented, justifiable, undertaken under the supervision of the project Arborist and that those changes will not cause detriment or damage to the tree;
- require the project Arborist to undertake site inspections not less than weekly to ensure that Tree Protection measures are in place.
- require the project Arborist to a written record (e.g. field notes and photos) to provide evidence of site attendance and compliance with the approved conditions of consent
- require the project Arborist to forward a copy of the written record of inspection to the Principal Certifying Authority within 1 week of that inspection occurring.
- require the project Arborist to identify that whether there is a breach of the Tree Protection Plan. If a breach is identified the project arborist must report this to the Principal Certifying Authority and specify any remedial works and the timeframe in which these works must be completed. If an inspection reveals that there has been a significant breach of the Tree Protection Plan (specifications), inspections from then on must be carried out twice weekly.

The approved Tree Protection Plan and its protection measures shall be in place prior to demolition commencing and a copy of the plan shall be retained on site at all times.

Appendix - Development Control Plan Compliance

Development Control Plan 2014

Part C - City-wide Controls

The proposal satisfies the objectives and controls under Penrith DCP 2014, as outlined below:

C1 Site Planning and Design Principles

The site is not mapped on Council's scenic and landscape values map, and therefore the controls under s 1.1.2 do not apply in this instance. The application does not propose any buildings works, and so built fo are not applicable.

C2 Vegetation Management

The site is not mapped on Council's Biodiversity Significant Map. However, the site contains an existing r Corymbia sp (Corymbia) located to the south edge of the site, which is to be retained. Accordingly, the a was reviewed by Council's Tree Management Officer, who provided the following advice relating to the rete ongoing protection of this tree:

- An Arborist with a minimum AQF (Australian Qualification Framework) Level 5 will need to be engage duration of the approved works to ensure that tree protection measures on the site are implemented complied with.
- ensure that demolition can be undertaken in such a way that machinery will not be required to enter designated Tree Protection Zone (TPZ) and so that building debris does not fall into the TPZ of the *C (Corymbia)* located on the southern boundary.
- a Tree protection Plan (Specification) and Drawing written in accordance with *AS 4970 - 2009, Prote Trees on development sites* shall be documented for and implemented on the site to appropriately re protect the *Corymbia sp (Corymbia)* located on the southern boundary.

With consideration to the above, the proposal satisfies the objectives of Chapter C2.

C10 Transport, Access and Parking

To ensure the proposal does not result in adverse traffic impacts as a result of works, noting the consider of demolition works, a condition of consent has been imposed requiring that
prior to the commencement of any demolition or remediation works, a Construction Traffic Management P to be submitted to and approved by Penrith City Council’s Asset Management Department.

E11 Penrith

In review of Figure E11.2 Penrith City Centre Character Areas, the subject site is located within the area as 'City Park and City Square'. The current proposal seeks site preparation works to deliver the site as a park. As such, the proposal is considered consistent with the objectives of Chapter E.11.

Penrith City Council

Statement of Environmental Effects
Demolition and Remediation

42-50 Station St, 134-144 Henry St
and Port Henry St Carpark
PENRITH NSW

14 December 2020

58140/134529 (Rev A)

JBS&G

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Version: 1, Version Date: 14/04/2021

Table of Contents

Abbreviations vi

1. Introduction 1
   - 1.1 Introduction and Background 1
   - 1.2 Objective of the Proposal 1
   - 1.3 Brief Description of the Proposal 1
   - 1.4 Purpose of the Statement of Environmental Effects 1

2. Background 2
   - 2.1 Site Identification 2
   - 2.2 Site Description 2
     - 2.2.1 The Dry Cleaner, 134-138 Henry Street, Penrith 2
     - 2.2.2 Shop 3, 140 Henry Street, Penrith 3
   - 2.3 Surrounding Land Use 3
   - 2.4 Site History 3
   - 2.5 Penrith City Council and City Park 4
   - 2.6 The Proposed Development 4
   - 2.7 Demolition 5
   - 2.8 Remediation 5
   - 2.9 Hours of Operation 6

3. Existing Environment 7
   - 3.1 Site Condition 7
   - 3.2 Topography 7
   - 3.3 Geology 8
   - 3.4 Acid Sulphate Soils 8
   - 3.5 Salinity 8
   - 3.6 Hydrology 8
   - 3.7 Hydrogeology 9
   - 3.8 Air Quality 9
   - 3.9 Flora and Fauna 9
   - 3.10 Traffic 10
   - 3.11 Noise 10
   - 3.12 Heritage 10
   - 3.13 Aboriginal Relics 10
   - 3.14 Hazardous Materials 10
   - 3.15 Site Contamination Status 11
     - 3.15.1 Preliminary Environmental Site Assessment Report 11
     - 3.15.2 Phase 2 Environmental Site Assessment, JBS&G (2017) 11

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.15.3 Data Gap Investigation – Penrith Central Village Park....12
3.15.4 Pre Remediation Investigation....12
3.15.5 Summary of Contamination Issues....12
3.16 Meteorology....13
4. Environmental Impact Assessment....14
4.1 Ecologically Sustainable Development....14
4.2 Resource and Energy Use....15
4.3 Air Quality....15
4.4 Surface Water Quality....16
4.5 Groundwater Quality....17
4.6 Noise....17
4.7 Traffic....18
4.8 Soil Quality....18
4.9 Visual Amenity....19
4.10 Hazards and Health Issues....19
5. Legislative Requirements....20
5.1 Environmental Planning and Assessment Act 1979....20
5.2 Environmental Planning and Assessment Regulation 2000....20
5.3 Protection of the Environment Operations Act 1997....21
5.4 Contaminated Land Management Act 1997....21
5.5 Water Act 1912....21
5.6 Waste Avoidance and Resource Recovery Act 2001....21
5.7 Protection of the Environment Operations (Clean Air) Regulation 2010....21
5.8 Protection of the Environment Operations (Waste) Regulation 2014....22
5.9 State Environmental Planning Policy 11 – Traffic Generating Development....22
5.10 State Environmental Planning Policy 33 – Hazardous and Offensive Industries....22
5.11 State Environmental Planning Policy 55 – Remediation of Land....22
5.12 Sydney Regional Environmental Plan 20 – Hawkesbury – Nepean River 1997....22
5.13 Penrith Local Environmental Plan 2010....23
5.14 Penrith Development Control Plan 2014....23
6. Conclusions and Recommendations....25
7. Limitations....26

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

List of Tables

Table 2.1: Summary Site Details 2

Table 3.1 Areas of Environmental Concern (AEC) and associated Contaminants of Potential Concern 13

List of Figures

Figure 1 Site Location

Figure 2 Site Layout

Figure 3 Sample Locations and Remedial Extent

Figure 4 Proposed Site Layout and Utilities

Figure 5 Suitable Areas for Containment Cell

Appendices

Appendix A Remedial Works Plan

Appendix B Remedial Action Plan

Appendix C Hazardous Materials Building Survey

Appendix D Environmental Site Assessment Dry Cleaner 2016

Appendix E Detailed Site Investigation 2017

Appendix F Data Gap Investigation 2019

Appendix G Pre-Remediation Investigation 2020

Appendix H Construction Environmental Management Plan

Appendix I Draft Long Term Environmental Management Plan

Appendix J Site Auditor Advice

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Abbreviations

Term	Definition
ACM	Asbestos Containing Material
AHD	Australian Height Datum
ASS	Acid Sulfate Soils
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CEC	Cation Exchange Capacity
COPC	Contaminants of Potential Concern
Council	Penrith City Council
CSM	Conceptual Site Model
DA	Development application
DGI	Data Gap Investigation
DO	Dissolved Oxygen
DP	Deposited Plan
DPI	Department of Primary Industry
DQI	Data Quality Indicator
DQO	Data Quality Objective
EC	Electrical Conductivity
Eh	Redox Potential
EIL	Ecological Investigation Levels
Envirolab	Envirolab Services Pty Ltd
EPA	NSW Environmental Protection Authority
ESA	Environmental Site Assessment
ESL	Ecological Screening Levels
Eurofins	Eurofins MGT
GME	Groundwater Monitoring Event
GPS	Global Positioning Unit
ha	Hectare
HIL	Health Investigation Levels
HSL	Health Screening Levels
JBS&G	JBS&G Australia Pty Ltd
LOR	Limit of Reporting
NATA	National Association of Testing Authorities
OEH	Office of Environment and Heritage
PAH	Polycyclic Aromatic Hydrocarbons
PARCCS	Precision, Accuracy, Representativeness, Comparability, Completeness and Sensitivity
PCB	Polychlorinated Biphenyls
pH	Potential of Hydrogen
PID	Photo-ionisation Detector
ppm	Parts Per Million
QA/QC	Quality Assurance / Quality Control
RAP	Remedial Action Plan
RL	Relative Level
RPD	Relative Percent Difference
SWL	Standing Water Level
RWPs	Remedial Works Plan
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
UPSS	Underground Petroleum Storage System
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
VVSAQP	Vapour Validation Sampling Analytical and Quality Plan

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1. Introduction

1.1 Introduction and Background

The Statement of Environmental Effects (SOEE) has been prepared to accompany a Development Application for the proposed demolition and remediation works to be undertaken with the western portion of the proposed Penrith Central Village Park (City Park). The site location and boundary are presented in **Figure 1**. The site is legally identified as Lot 1 in DP 164798 and Lot 1 in DP 252457 (134 to 138 Henry Street), Lot 10 and 11 in DP 553665 (140 to 142 Henry Street), Lot 2 in DP 556075 (144 Henry Street), Lot 3 in DP1200790 (42 to 44 Station Street), Lot 1 in DP 526304 (48 to 50 Station Street) and Lot E in DP 163176 (46 Station Street). Notwithstanding the descriptions, portions of the site are also referred to as being present with the former Allen Place Car Park. The extent of the site is shown on **Figure 2**.

The SOEE describes the site, its environment, the proposed development and provides an assessment of potential environment impacts associated with the proposal. The SOEE has been prepared by JBS&G Australia Pty Ltd (JBS&G), as per the instruction of Penrith City Council (PCC).

1.2 Objective of the Proposal

The demolition and remediation works are being undertaken by PCC to identify the extent of historical contamination within the site and encapsulate the contamination to mitigate any potential health or ecological risk. The encapsulation / long term containment of contaminated soils as will be achieved with the remedial works will facilitate site suitability for a future development as the proposed City Park.

1.3 Brief Description of the Proposal

The works described by this SOEE will be undertaken in two parts, namely the demolition component of the works and the remediation component of the works. The demolition component of the works will include the removal of existing buildings and pavements across the extent of the site. This will facilitate making the complete extent of the site accessible for environmental investigations which is required to define the extent of proposed remedial works.

The remediation component of the works will include the excavation of potential asbestos and known chlorinated contaminated soils present across the extent of the site and consequent of the historical importation of fill materials to the site during initial development and uncontrolled releases form a historical dry cleaning activity undertaken on the site. The contaminated soils will be consolidated and encapsulated within a central portion of the site for long term management. The consolidation / encapsulation and anticipated long term management will be sufficient to mitigate the potential health and ecological risk of these materials to allow the site to be developed as the proposed City Park.

1.4 Purpose of the Statement of Environmental Effects

The purpose of this SOEE is:

- To document the existing environment of the area of the proposed City Park;
- To assess the potential environmental impacts of the demolition and remediation works to be undertaken on the site; and
- To provide the consent authority, the public, any relevant government authorities and the applicant with sufficient information to make informed decisions in relation to the proposal.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2. Background

2.1 Site Identification

The site location is shown on **Figure 1**. The extent of the site and associated cadastral boundaries are shown on **Figure 2**. The site details are summarised in **Table 2.1** and described in detail in the following sections.

Table 2.1: Summary Site Details

Property Identification and Street Addresses	The site is comprised of the following legal properties: • Lot 1 in DP 164798 and Lot 1 in DP 252457 – 134 to 138 Henry Street • Lot 10 and 11 in DP 553665 – 140 to 142 Henry Street • Lot 2 in DP 556075 – 144 Henry Street • Lot 3 in DP1200790 – 42 to 44 Station Street • Lot 1 in DP 526304 – 48 to 50 Station Street • Lot E in DP 163176 – 46 Station Street In addition, the site area includes portions of the Allen Place Car Park.
Local Government Authority	Penrith City Council
Approximate MGA Coordinates (MGA 56)	Easting: 286582.2 Northing: 6262912.7
Site Zoning	Commercial Core (B3) and Public Recreation (RE1) under Penrith Local Environmental Plan (LEP) 2010
Current Use	Commercial (car parking, retail and services)
Previous Use	Commercial/industrial (car parking, dry cleaning and general retail/services) and residential
Proposed Use	Public open space
Site Area	Approximately 0.71 ha

2.2 Site Description

The key features from the areas that form the focus of the proposed demolition and remediation works within the extent of the City Park area are discussed in the following sections and shown on **Figure 3**. The discussions are focussed to the most significant areas of the site with respect to the occurrence of site contamination that has necessitated the works as described in the SOEE.

2.2.1 The Dry Cleaner, 134-138 Henry Street, Penrith

The former dry cleaner comprised the northern third of the building (referred to as Shop 3, Gaymark Lane) located at 134-138 Henry Street, Penrith. The shop-front occupied most of the building footprint (>85 %), with the remainder comprising a secluded water closet, storage space and point of sale. The premise was vacant during the period of the investigation.

The water closet comprised a small (<3 m^2), fully enclosed space which was serviced by two separate sewerage disposal points. Detergents, household solvents and soaps were observed to be stored within the water closet. The shop-front was serviced by an air exchange (air-conditioning) unit which was observed to be operational during each visit to the premises.

In the alleyway between the dry cleaner and Shop 3 (140 Henry Street, described below), numerous services were present. Sewerage infrastructure and stormwater pipes ran in a north to south orientation, connecting stormwater and sewerage pipes to the greater system, south of the premises. Services were noted to comprise a mixture of terracotta and polyvinyl chloride (PVC) pipes.

The southern portion of 134-138 Henry Street was inaccessible during the period of the investigation, in which it is noted a café was operating.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2.2.2 Shop 3, 140 Henry Street, Penrith

None of the building spaces located on 140 Henry Street were accessible during the period of the investigation due to business/tenants still operating. Therefore, the observations described below are based on an inspection by a suitably qualified and experienced JBS&G environmental consultant conducted on 3 May 2018 and detailed in the RAP (JBS&G 2019a).

Shop 3 comprised the southern half of the building located at 140 Henry Street, Penrith. The shop was partitioned into four rooms and a water closet, joined by a central hallway. The premises housed an alternative health centre at the time of the inspection.

The shop-front rooms were serviced by air exchange units (air conditioners) which were observed to be in operation during each site visit. The water closet comprised a small (<5 m^2), fully enclosed space which was serviced by two separate sewerage disposal points.

An inspection of the property revealed the presence of household cleaning and medical products: limescale solvents, surface cleaners, stain removers, methylated spirits, polishes, pest control products, ethanol-based surface wipes and carpet deodorisers.

2.3 Surrounding Land Use

The current land uses of adjacent properties or properties across adjacent roads are summarised below.

- North – The site is bound to the north by Henry Street and then numerous commercial premises including UFC Gym, Queens of Hearts Community Foundation and Nepean College. Further north is an open carpark and commercial premises on Belmore Street, including Bob Jane T-Marts and Veterinary Hospital;
- East – To the east of the site is Woodriff Street North, followed by commercial premises and Edwards Place carpark. Further east a Pathology Centre and testing laboratory are present;
- South – The is was bound to the south by Allen Place, following which are multiple commercial properties including cafes, a medical centre and pharmacy. Beyond High Street commercial premises are present; and
- West – The site is bound to the west by Station Street, then medium to high density commercial premises. Further to the west is Peach Tree Creek and eventually the Nepean River.

2.4 Site History

Previous contamination assessments undertaken at the site presented a site history review based on the following information sources:

- Section 149(2&5) certificates obtained from council from three representative lots;
- Current and historical land title records;
- Records of stored Dangerous Goods held by WorkCover;
- Historical aerial photographs obtained from the Department of Lands;
- Publicly available heritage records held by the Department of Planning and Environment and Council, where readily available;
- Council Development Application / Building Application (DA/BA) records; and
- Records of environmental incidents, former environmental licences, or contaminated land notices or notifications, available from the EPA.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

The site was reported to have been used for a range of residential and commercial purposes throughout the period over which records were available. Section 149 (2&5) certificates, historical land title records and aerial photographs indicate that the site comprised primarily low density residential premises from 1881 to 1949, following which it was progressively redeveloped into a commercial precinct.

The commercial precinct included mostly low-risk activities such as restaurants, retail and other services. Two premises were identified to have previously been used for activities with elevated potential to cause contamination of the land:

- Shop 3/134-138 Henry Street, Penrith – dry cleaning services (1977 – 2016); and
- 118-120 Henry Street, Penrith – garage proprietary services (1967 – 1973).

The previous assessments have identified contamination within the vicinity of the former dry cleaner (Shop 3/134-138 Henry Street). Following identification of contamination underlying and within the vicinity of the premises, Council notified the NSW EPA of contamination present at Shop 3/134-138 Henry Street.

Subsequently the EPA provided a response to Council (EPA 2018) which made the determination that regulation of the chlorinated hydrocarbon impacts present at Shop 3/134-138 Henry Street under the Contaminated Land Management Act 1997 was not currently required.

No items of aboriginal or European heritage were identified at the site.

2.5 Penrith City Council and City Park

Penrith City Council has reported a proposal to transform the Penrith City Centre by unlocking the precinct to major opportunities with the delivery of a new City Park.

The City Park is described as being a significant open space in a prime location on the corner of Henry Street and Station Streets, Penrith. City Park will be a vibrant, thriving, green space with something for everyone and plenty of opportunities to meet, retreat, eat, be active and celebrate together. These aspects are expected to strengthen its appeal as a destination for residents, workers, and visitors and stimulate the day and night time economy.

Key features of the City Park design include a variety of large trees to provide shade, a sensory garden, several water features, as well as natural landscaping to transform the space into an urban retreat. The concept design also provides space for people to meet, eat, be active and celebrate together with these aspects set to stimulate the day and night time economy by attracting residents, visitors and investors.

The proposed conceptual development plans are shown as **Figure 4**.

2.6 The Proposed Development

The proposed development can be described in two stages:

- Demolition works across the extent of the proposed City Park comprising removal of buildings and pavements; and
- Subsequent to the completion of demolition works, undertaking site remediation works to excavate the extent of site contamination and relocated within a controlled location for long term containment / encapsulation.

The work activities to be undertaken in each of these stages is described in more detail following. At the completion of the works, the site will be rendered to a condition that is suitable, from a contamination perspective, for redevelopment by PCC for the proposed future use as City Park.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2.7 Demolition

The demolition stage of the works will be initial stage of the works. The demolition works will include the removal of all above ground infrastructure across the extent of the site. As can be observed from **Figure 2** a range of existing retail and commercial buildings are currently present across the site. The remaining area of the site can be observed to be paved as associated with the current use for car parking and as Allen Place.

In undertaking demolition works PCC shall only use Workcover accredited and Council endorsed contractors. All demolition works shall be undertaken as per relevant statutes and Australian and International Standards.

The majority of the demolished materials will be transported of-site for recycling. This will include reclamation of all masonry / concrete based materials, metallic wastes from buildings across the extent of the site. Further asphaltic / concrete based materials from site pavements will be removed and segregated to allow off-site recycling All other wastes shall be transported to a facility legally able to accept them.

2.8 Remediation

The Remedial Workplan which describes the methodologies and procedures to achieve the remediation of the site is provided as **Appendix A**. The Conceptual Remedial Action Plan which has premised the selection of the remedial methods in the Remedial Work Plan is provided as **Appendix B**. A Site Auditor accredited under the *Contaminated Lands Management Act 1997* has been appointed to review the proposed remedial strategy. A Site Audit Report and interim advice provided by the Site Auditor is included as **Appendix J**.

The remedial works are required to address contaminated soils as identified as:

- Fill material underlying buildings which is reported to be impacted with asbestos. These fill materials are generally characterised as being present to a near surface depth, having been historically imported to stabilise the site surface. The extent of asbestos impacts is not known at this stage and will be able to be determined by observation of all site soils following demolition works;
- Chlorinated ethene impacted soils as identified underlying 134-138 and 140 Henry Street. These soils have been caused to be impacted by historical uncontrolled releases of dry cleaning fluids (i.e. tetrachloroethene, PCE) from a former dry cleaners as located in this area. Demolition of the overlying buildings will facilitate the assessment of the extent of chlorinated ethene impact. It is considered likely that historical trenches / easements as placed for services will have acted as preferential pathways of chlorinated ethene migration and will control the extent of chlorinated ethene impact; and
- Soils underlying the electrical Transformers in the south-eastern portion of the site have not been previously assessed. There is a potential for contamination here as consisting of asbestos or otherwise dielectric fluids as historically used for the transformers.

The remedial method, following delineation of the extent of impacted soils, is to encapsulate the soils on-site for long term management. The remedial approach is described as containment by the implementation of physical separation or within a “Capping Layer”. The remedial / management method is intended to eliminate the direct contact exposure pathway for impacted soils. The preclusion of buildings from overlying or in proximity of the contained soils precludes potential vapour intrusion of chlorinated ethenes and exposure to potentially elevated levels chlorinated ethene vapours.

The physical separation shall be implemented by the following measures:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Impermeable Layer – in areas not covered in hardstand, the materials subject to containment will be required to be covered with a geosynthetic clay liner (GCL) layer with a hydraulic conductivity of less than 5 x 10^{-11} m/s. This is likely to consist of a geotextile as impregnated with / containing bentonite

  In areas of proposed hardstand on the redeveloped site / City park, the GCL layer is not required;

- Marker Layer - comprising a bright orange geotextile, such as "Bidim" or similar geotextile, is to be installed prior to placement of the capping layer. The marker layer is required to be easily recognisable in soils (i.e., bright orange in colour), be durable as a long term marker layer (i.e., >150 grams per square metre) and maintain integrity during remedial/civil works;

- Capping Layer - A minimum 1.0 m (after compaction) capping layer of soil capping material / thickness is required to manage access to asbestos impacted soils across the areas subject to containment. Material imported to site for use as a capping layer will be required to be environmentally suitable material for human and/or ecological exposure (as appropriate). Imported material shall comprise imported virgin excavated natural material (VENM) or material certified in accordance with an exemption issued by the NSW EPA (i.e. ENM, recycled fines etc) and the RAP (JBS&G 2019). The materials may otherwise consist of VENM as generated by excavation of the area used for encapsulation / containment; and

- Should services extend through asbestos impacted soils, then they will be required to be placed in dedicated alignments, demarcated (with a marker layer at the base and walls of the trench) and backfilled with clean material to avoid exposure to underlying impacted material during subsequent maintenance or excavation work.

The lateral extent of the soils containment has been shown on **Figure 5**. The ongoing maintenance of the contained soils shall be controlled by a proposed long term Environmental Management Plan (LTEMP) to be implemented on the site. The current draft of LTEMP is provided as **Appendix I**.

The remedial works will result in a building platform being available that will be suitable from an ecological and human health perspective for the proposed redevelopment as City Park.

2.9 Hours of Operation

Proposed working hours on this project are:

- 7:00 am to 6:00 pm Monday to Friday; and
- 8:00 am to 3:00 pm Saturdays.

No work will be conducted on Sundays and Public Holidays.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3. Existing Environment

3.1 Site Condition

The overall site is characterised as an irregularly shaped, large commercial precinct bound by the Allen Place loop, Henry Street, Station Street and 98-100 Henry Street. The site area includes the Allen Place car park and ten commercial premises on the southern side of Henry Street in Penrith. The borders of the site were not secured and open to the public (pedestrians and vehicles). The site was utilised for a range of commercial operations at the time of the site investigation including a car park, retail shops and cafes. High pedestrian and vehicular traffic was observed during working hours. All commercial premises at the site were noted to be occupied.

The site generally sloped downward from east to west, with a slight ridge line observed to dissect the centre of the car park. Inspection of site surfaces and comparisons with the surrounding landscape indicated that significant topographical alterations had not occurred.

The majority of ground surfaces were sealed as asphaltic pavement, concrete pathways, and building footprints with onsite drainage channels directing surface water toward the municipal stormwater system. The balance of the site comprised unsealed grounds in the form of garden beds.

Buildings at the site did not exhibit significant indicators of dilapidation, although minor wear, consistent with the age of the buildings was observed. A detailed inspection/hazardous building materials survey of the existing site structures has been completed and is included as **Appendix C**.

No surface water was present at the site at the time of the investigation. No evidence of waste storage, except for commercial municipal waste bins, or storage tanks were observed at the site. No olfactory indicators of volatile chemical usage were encountered during the most recent site inspections. No visual indicators of gross or widespread contamination were observed.

Four transformers were observed: one in the southwest and east corners of the site and two along the northern boundary of the Allen Place Car Park, which were on raised concrete platforms. No hydrocarbon staining was observed to be associated with the transformers. The location of the transformers is shown on **Figure 3**.

3.2 Topography

Review of topographic information obtained from previous assessments as completed has reported that the regional topographic map indicated that the site surfaces have an elevation of approximately 30 m Australian Height Datum (AHD). The site generally slopes downwards to the west, towards the Nepean River.

Site inspection confirmed that the topography on site was not significantly altered from the natural alignment and sloped slightly downward toward the western boundary, Station Street. A local ridge line existed which dissected the Allen Place Car Park in an approximately west to east alignment, with site surfaces sloping downwards perpendicular to the ridge line.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.3 Geology

Reference to the 1:100 000 Geological Series Sheet for Penrith, DMR (1991) indicates that the site is underlain by Bringelly Shale of the Wianamatta Group originating from the Middle Triassic epoch. This unit is comprised of shale, carbonaceous claystone, claystone, laminite, fine to medium-grained lithic sandstone, rare coal and tuff. Bringelly Shale is underlain by Ashfield Shale and, at depth, Hawkesbury Sandstone.

Reference to the 1:100 000 Soil Landscape Series Sheet for Penrith, DMR (1990) indicates that the site is within the Richmond Soil Landscape group. This group of landscape is characterised by quaternary terraces of the Nepean and Georges Rivers. Relatively flat (slopes <1 %) and level. Splays, levees provide local relief of <3 m. Formerly a low open woodland. Richmond soils are poorly structured orange to red clay loams, clays and sands. Texture may increase with depth. Ironstone nodules may be present. Plastic clays in drainage lines, red earths and red podzolic soils occur on terrace surfaces with earthy sands on terrace edges. Limitations of the Richmond group include high erosion hazard on terrace edges and minor localised flooding.

The lithology observed during previous investigations has been described as follows:

- Fill materials over some portions of the site ranging from 0.15 m to 1.9 m depth. Fill was generally deeper underlying the commercial properties at the site, and shallower throughout the Allen Place car park. Fill materials were generally identified to comprise a combination of silts and clays with varying sand content. Colours were observed to be primarily brown and grey with some orange/yellow clays also encountered. Anthropogenic inclusions were observed within fill material from some locations;
- Shallow to moderately deep alluvial soils comprising clay to sandy clay (present from a depth of 0.4 m to 10.5 m below ground surface (bgs));
- Moderately deep to deep alluvial clay to sandy clay mixed with Nepean River gravels (present from a depth of 6.1 m to 13.0 m bgs); then
- Residual shale bedrock (present from a depth of 13.0 m to 15.0 m bgs).

3.4 Acid Sulphate Soils

No potential for acid sulphate soils has been identified at the site.

3.5 Salinity

The site exists within an area of 'moderate salinity potential'. Vegetation at the site during the site inspection did not exhibit any indicators of salinity related stress.

3.6 Hydrology

Rainfall is considered likely to migrate primarily through surface water runoff into the municipal stormwater system. Minor infiltration into the underlying porous soils and surface is also expected in areas of unsealed ground.

As discussed in **Section 3.2**, the site is largely covered by concrete, asphaltic pavements and building footprints. As such, surface water generated during periods of rainfall is anticipated to primarily enter the municipal stormwater system; via discharge into onsite stormwater catchment infrastructure or alternatively discharge into stormwater pits within the surrounding roadways. Increased infiltration is anticipated with the site's redevelopment as City Park

The nearest water body to the Site is Peach Tree Creek, approximately 1.1 km to the west of the site boundary. Peach Tree Creek ultimately contributes to the Nepean River. Municipal stormwater discharges to the Nepean River.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.7 Hydrogeology

Registered groundwater bore information was obtained from the NSW Department of Primary Industries groundwater mapping tools. A review of the registered bore information indicated that there were thirteen bores within a 1.5 km radius of the Site. Based on the reported geology, topography and depth to groundwater, groundwater migration is expected to occur in a north-westerly direction, towards Peach Tree Creek approximately 1.2 km away. Groundwater has been reported in the surrounding properties within the river gravels layer. Previous assessments as completed on the site have reported groundwater depths ranging from 6.96 m to 8.05 m bgs, with ground contour maps indicating that groundwater flows in a north-westerly direction.

Registered groundwater bores located within a 1.5 km radius of the site are used for monitoring, recreational and testing purposes. Given the relatively dense urban use of the site and surrounding properties, in addition to the identified licensed bores, there is a moderate probability of additional undocumented bores near the site. No reported utilisation of groundwater as a drinking water source has been reported.

3.8 Air Quality

Air quality in the Penrith region is impacted by a range of air pollution emissions sources including major industry, motor vehicles, commercial operations and leaking pipes and tanks as well as from domestic activities such as solid fuel heaters.

Particles (or particulate matter) in the atmosphere come from a wide variety of sources, including soil (dust), vegetation (pollens and fungi), sea salt, fossil fuel combustion, biomass burning and industrial activities. Particles in the atmosphere typically exhibit a bi-modal sizes distribution with a peak in the range of 0.1-2.5 µm and a second peak in the range 2.5-50 µm. As a result particles with a diameter of up to 2.5 µm (PM2.5) are commonly referred to as fine particles. There is also a distinction in the health effects of different sized particles. Particles up to about 10 µm (PM10) diameter are inhaled, whereas larger particles are not. On this basis, the term ‘fine particles’ is often used to refer to PM10.

The most significant source of fine particles in proximity of the site are bushfire events (back burning or otherwise) and residential use of wood fired heaters during winter months.

Trace levels of a range of other constituents can often be reported in metropolitan environments including nitrous oxides and sulfur dioxide as consequent of a range of industrial processes and motor vehicle emissions. Trace levels of other hazardous gases can also occur in urbanised areas including petroleum hydrocarbons of relevance to the works being undertaken PCE. These trace levels in the case of petroleum hydrocarbons can be related to vehicle emissions. PCE is a commonly used cleaning solvent, and can occur form fugitive sources such as dry cleaning operations.

3.9 Flora and Fauna

No significant areas of native vegetation are present on the site. Isolated areas of vegetation, consisting of minor garden / grassed areas and some remnant native trees are present in isolate areas of the site between the expanses of pavement that characterise the extent of the car park and buildings on the site. These plant communities are not considered ecologically significant.

No significant fauna communities have been identified on the site. The historical commercial / developed nature of the Penrith CBD and proximity of more suitable habitats (i.e. Nepean River foreshore areas etc) restricts the potential for fauna occurrence on the site. No threatened fauna communities or species have been identified on the site.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.10 Traffic

The site is located within the central business district of Penrith City and significant traffic occurs as associated with major local roadways in proximity of the site including High St, Henry St and Station St. Traffic is generally restricted to vehicle movements as associated with the local businesses in proximity of the site, which generally includes retail and professional services.

Heavy traffic is generally absent from the proximity of the site, apart from deliveries to existing businesses in proximity of the site. Passing heavy traffic is generally restricted to the Great Western Highway (Jane St) to the north of the site.

3.11 Noise

Noise levels in proximity of the site are typical of a CBD / retail / commercial environment. Common noise sources observed on the site include:

- Local traffic movements on Henry and Station Sts adjoining the site;
- Regional traffic movement on; and
- Existing retail activity as associated with the range of businesses / public service offerings in proximity of the site.

3.12 Heritage

No items of heritage significance are present on the site.

3.13 Aboriginal Relics

The site has been heavily modified over its development history from its natural state. Re-profiling and levelling of the site surface and substantial filling works that have been observed to occur have caused the alteration of the site. The occurrence of aboriginal relics is considered to be highly unlikely.

3.14 Hazardous Materials

The site has been historically developed since the late 1940's into the retail / commercial district currently present. This has included construction of a range of structures across the extent of the site as shown in **Figure 2**. The occurrence of hazardous building materials in structures has been assessed as per a hazardous materials building survey recently as included as **Appendix C**.

Hazardous materials identified on the site have included:

- Asbestos as present as friable asbestos dusts;
- Bonded asbestos building products;
- Lead containing dusts;
- Synthetic mineral fibres; and
- Polychlorinated biphenyl (PCB) containing light fittings.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.15 Site Contamination Status

A number of previous contamination assessments have been prepared for the site. These are provided as **Appendices D** to **G**. The findings of these investigations are discussed following.

3.15.1 Preliminary Environmental Site Assessment Report

Council engaged Geo-Logix Pty Ltd (Geo-Logix) to conduct a preliminary ESA, Geo-Logix (2016) at the property located at 134-138 Henry Street, Penrith, NSW. The preliminary ESA is provided as **Appendix D**. The preliminary assessment was undertaken to assess the potential for contamination to exist at the site given the presence of Shop 3/134-138 Henry Street within the preliminary assessment area and the undertaking of a dry cleaning activity.

The preliminary ESA indicated that the site appeared to be vacant until the 1950s. In the period intervening construction of the current building layout and its former vacant use, the site was used for storage of materials. The building layout as observed in the current investigation was constructed during the 1960s and the dry cleaner operated from 1977.

Geo-Logix carried out passive soil vapour assessments at two locations within the dry-cleaning shop. Chlorinated ethenes (CEs) including tetrachloroethene (PCE), trichloroethene (TCE) and dichloroethenes (DCE) were detected in soil vapour samples at concentrations in exceedance of the commercial land-use criteria adopted for the assessment. Additionally, benzene, toluene, ethylbenzene and xylene (collectively referred to as BTEX) compounds were detected within the soil vapour at concentrations above the laboratory limit of reporting (LOR) but below the commercial land use criteria. The preliminary ESA report identified the presence of potential asbestos containing materials (ACM) forming part of the construction of building within the assessment area.

The site was notified to the EPA by Council following the works undertaken by Geo-Logix in accordance with the reporting requirements under the *Contaminated Lands Management Act 1997*.

3.15.2 Phase 2 Environmental Site Assessment, JBS&G (2017)

JBS&G was engaged by Council to undertake a detailed site investigation (DSI) / phase 2 environmental site assessment at the site. The assessment is provided as **Appendix E**. The assessment was required to assess the potential for contamination to represent unacceptable risks to future site users based on future land uses proposed under the Central Park Village redevelopment.

Sampling and analysis works were undertaken including site inspection, sampling and analysis of soil samples, installation and sampling of groundwater monitoring wells and collection of soil vapour samples from sub-slab soil vapour locations. The assessment reported that the presence of buildings and occupied tenancies during the investigation precluded detailed assessment of all site areas.

Site conditions were observed to comprise hardstand pavements with underlying fill materials encountered to depths ranging from 0.2 m and 2.0 m bgs. Fill comprised a combination of silts and clays with varying sand content. Anthropogenic inclusions were observed within fill material at some locations.

Sample results from the soil vapour sampling and analyses indicated that CE impacts were present within the vicinity of the dry cleaner. Vapour impact was found to extend north of the dry cleaner, along the inferred groundwater flow direction, with exceedances of the adopted soil vapour criteria (PCE and TCE) at some locations.

Elevated levels of PCE and toluene were further in groundwater at one location in proximity of the dry cleaner, exceeding the most conservative of the assessment criteria adopted in the investigation. Detections of total recoverable hydrocarbons (TRHs) were also reported in multiple groundwater samples. The source of the TRH impact was unclear. The TRH concentrations were not considered representative of a risk to future onsite/offsite receptors.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Groundwater and soil concentrations within the vicinity of the dry cleaner also indicated the presence of CEs, primarily PCE and TCE, albeit at concentrations which were below the adopted site assessment criteria. With respect to the position of the dry cleaner, the inferred groundwater flow direction and available sewer diagrams, the presence of elevated PCE and TCE within the groundwater sample from the proximity of the dry cleaner indicates that CEs may have migrated along the sewerage infrastructure prior to their release into the environment.

3.15.3 Data Gap Investigation – Penrith Central Village Park

The Data Gap Investigation (DGI) comprised targeted soil, groundwater, soil-vapour and indoor air sampling. The assessment is provided as **Appendix F**. Sampling locations were undertaken within the vicinity of the former dry cleaner. It was reported that there were no statistically significant exceedances of the adopted site investigation criteria for the COPCs in soils; groundwater concentrations were less than relevant adopted environmental guidance values, with the exception of PCE in a well in closest proximity of the former dry cleaner; elevated levels of CE's were reported to exceed the adopted assessment criteria at one location in proximity of the former dry cleaners; elevated levels of CE's were reported in soil vapour at other locations in proximity of the dry cleaner; and the ,majority of indoor air measurements at the dry cleaner tenancy were below the adopted assessment criteria.

3.15.4 Pre Remediation Investigation

A pre-remedial investigation has been most recently completed on the site as targeted to the area of the dry cleaners, being Shop 3 Gaymark Lane as located at 134-138 Henry St Penrith. The assessment is provided as **Appendix G**. The assessment has comprised installation and assessment of sub-slab, shallow and deep soil vapour probes. Soil samples were further collected during the installation of the soil vapour probes and assessed for chlorinated ethenes.

The assessment has reported that where chlorinated ethene impact occurred in soils that it was non-leachable. The assessment further found that it was most likely that chlorinated ethene impacts were restricted to upper depth soils in proximity of the dry cleaners, and unlikely to an extend to a depth of 4 m bgs.

3.15.5 Summary of Contamination Issues

Areas of environmental concern are shown on **Figure 3** and summarised in **Table 3.1** following. Potential and known contaminated media comprise:

- Fill materials;
- Underlying natural soils;
- Subsurface vapour and ground gases; and
- Groundwater

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 3.1 Areas of Environmental Concern (AEC) and associated Contaminants of Potential Concern

Areas of Environmental Concern (AEC)	Contamination Status	Potentially Contaminated Media	Contaminants of Potential Concern (COPC)
AEC 1 – Former Dry Cleaner 134-138 Henry Street (Lot 1 DP164798) Improper disposal/management of dry-cleaning chemicals	Known	Soil, groundwater, soil-vapour and indoor air	Chlorinated Ethenes (PCE, TCE, DCE)
AEC 2 – Fill material Underlying Buildings Fill materials of unknown origin used for site levelling and activities associated with development. Application of COPCs as a result of general maintenance during site occupation (pesticides, herbicides, fuel and oil spills etc).	Potential	soils	Heavy metals, PAHs, TRH, BTEX, OCPs, PCBs, VOCs and asbestos
AEC 3 – Transformers Historical spillage/leakage of transformer oils underlying transformers within the Allen Place carpark.	Potential	Soils	TRHs and PCBs

AEC 1 Former Dry Cleaner

Soil, soil vapour and groundwater samples obtained during the DSI (Section 3.6.2) and DGI (Section 3.6.3) indicate that the greatest levels of chlorinated ethene impact is in the immediate vicinity 134-138 Henry Street and extending north and west of the premises. Detections of contaminant concentrations a considerable distance west of the premises provide evidence that the compounds may have migrated along the inferred sewerage infrastructure alignment.

AEC2 Fill Materials

Widespread impact has generally not been identified in fill based soils across the site. However detailed assessment of the soils has ben precluded by the extent of existing site structures and pavements. It is likely that asbestos impacts are present in these soils, and the extent of the same will be able to be determined once soils are able to be inspected following demolition works.

AEC3 – Transformer

There is a potential for dielectric fluids based contaminants to be present in close proximity / underlying the transformer. This will be able to be assessed following removal of the transformers.

3.16 Meteorology

A review of average climatic data for the nearest Bureau of Meteorology monitoring location (Penrith Lakes) indicates the site is located within the following meteorological setting:

- Average minimum temperatures vary from 5.5^{o} C in July to 18.5^{o} C in January;
- Average maximum temperatures vary from 17.7^{o} C in July to 30.7^{o} C in January;
- The average annual rainfall is approximately 728.1 mm with rainfall greater than 1 mm occurring on an average of 71.7 days per year; and
- Monthly rainfall varies from 30.6 mm in September to 121.4 mm in June with the wettest periods occurring on average in January to June.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4. Environmental Impact Assessment

4.1 Ecologically Sustainable Development

DUAP (1996) have defined ecologically sustainable development (ESD) in terms of the following four principles:

- The precautionary principle – namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for the postponing of measures to prevent environmental degradation;
- Inter-generational equity – namely, that the present generation should ensure the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;
- Conservation of biological diversity; and
- Improved valuation and pricing of environmental resources.

There are no threats of serious or irreversible environmental damage associated with the proposed demolition and remediation of the site. As such, there is no requirement to invoke the precautionary principle. Adverse environmental impacts associated with the development will be minimal when subject to the proposed controls identified in the remainder of **Section 4** and when compared to the ongoing environmental impact as present on the site. Positive environmental impacts will occur consequent of the remediation of the site.

Inter generational equity is being achieved by the reduction of the availability of contamination to reduce potential exposures to environmental contamination to a level closer to those present on the site in its original condition (prior to urbanisation and development of Penrith). The recycling of materials on the site (where possible and as generated by demolition works) or transport to off-site recycling facilities, will enhance the environment for the future.

Current biological diversity on the site will be substantially enhanced. The current absence of flora and fauna will be addressed by the ultimate redevelopment of the site as City Park. Extensive green spaces, increased tree plantings etc as facilitated by the completion of the remedial works that will allow the construction of the City Park. There are no environmental impacts associated with the works that have been identified which would reduce the current biological diversity of the adjoining environment.

It is proposed to recover all materials possible which will be generated by the demolition works and transfer to recycling facilities in proximity of the site. The preferred remedial approach shall be to consolidate and encapsulate the contaminated soils within an appropriately designed structure on the-site. This will result in substantially reduced quantities of waste, and allow the utilisation of the available properties of the contaminated soils to act as an engineered fill. The recycling / re-use of materials, as opposed to simply disposing materials is evidence of the improved valuation and pricing of environmental resources that will be able to be achieved by the development.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4.2 Resource and Energy Use

The reduction of resource and energy use by PCC as a whole will be achieved in part by the demolition and remediation works proposed. PCC have identified a requirement to provide additional green space and recreational / leisure opportunities within the Penrith CBD. The remediation and ancillary demolition works on the City Park site will allow the site to be developed for the purpose of the proposed City Park.

Remediation works programs have been designed to minimise resource and energy use where possible. Options of on-site retention, re-use and ongoing management of contaminated materials have been selected in all stages of the Remedial Strategy (**Appendix B**) to preclude the potential for off-site transport and disposal having to occur.

4.3 Air Quality

There is a significant potential for air emissions from the proposed works. Potential significant sources of air emissions have been identified with the demolition and remediation phases of the works.

Potential sources of air emissions from demolition works include:

- Asbestos fibres from removal of asbestos containing materials from site building prior demolition;
- Particulate emissions from building demolition particularly inclusive of ground slab / footing removal; and
- Particulate emissions from pavement removal as proposed over the extent of the car parking area on the site.

Potential sources of air emissions from remediation works are substantially consequent of the proposed soils excavation / storage and handling aspects of these works. This will result in significant quantities of contaminated and non-contaminated soils being caused to be exposed. Potential air emissions that have been identified as associated these activities includes:

- Particulate emissions from exposed soils / soils handling and/or as associated with fugitive dust emissions from areas of pavement removal / non vegetated areas of the site;
- Potential asbestos fibre emissions from asbestos contaminated soils, particularly where asbestos impact occurs as friable forms of asbestos; and
- Potential chlorinated ethene vapour emissions from chlorinated ethene impacted soils.

A range of management measures are available to be implemented on site to eliminate or otherwise mitigate these potential air emissions. These are detailed in the Construction Environmental Management Plan (CEMP) as proposed for the project and included as **Appendix H**. As assessment of the likelihood of air emissions, considering the extent of available management actions, is summarised following:

- Asbestos emissions from demolition works will be minimised by undertaking the demolition works in a staged manner. All potential hazardous materials, including asbestos building materials, shall be removed from all structures by hand prior to undertaking bulk demolition. Environmental controls are available for the removal of asbestos including wetting of surfaces prior to handling / disturbance;
- Environmental controls inclusive of water sprays / wetting of surfaces will also be available to control potential emissions from pavement removal / building demolition. Controls are also available through management of the rate of demolition works and ceasing demolition works during unfavourable meteorological conditions;

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Similarly environmental controls are available to control potential environmental emissions from exposed soils / handling of soils. This will also include wetting of surfaces. Provision is also made in the CEMP for covering of stockpiles which will stop potential particulate emissions;
- The environmental controls as applied to soils to control particulates will be further effective to control potential asbestos fibre and chlorinated ethene vapour emissions. Notwithstanding, the area of chlorinated ethene vapours is relatively minor in extent and the chlorinated ethene constituents are generally not readily volatile from a soil matrix. Areas of asbestos impact, where they are identified, are also anticipated to be limited in extent. A range of studies are further available which demonstrate that asbestos fibres are not readily released from a soil matrix;
- Environmental monitoring methods are available to assess the potential levels of respirable fibres and speciated chlorinated ethene constituents. The assessment of monitoring results will allow the effectiveness of the management measures to be confirmed during the works.

On the basis of this assessment, it is considered that while potential significant air emissions may occur from the demolition and remediation works, appropriate management measures are available to eliminate or otherwise sufficiently mitigate potential emissions to a level that will not pose a potential health or ecological risk. Monitoring provisions are further available to ensure the effectiveness of these controls.

4.4 Surface Water Quality

Surface water will require to be controlled during parts of the demolition works and all stages of the remediation works. It is considered that the presence of excavations on the site will allow surface water to be minimised as surface water flows can simply be diverted into the excavations. However, where surface water leaves the site levels of contaminants will be required to have levels of impact below those stipulated NSW EPA endorsed water quality guidelines and as considered to be appropriate for fresh water receiving waters.

This will require measures to be put in place to prevent surface water being impacted by sources of sediment or site contamination. These will include:

- Controlling sources of surface water generation on the site;
- The retention where possible (i.e. for as long as possible) of existing stormwater control infrastructure located in contaminated areas of the site (requiring excavation);
- Isolation of impacted soil and stockpiles of demolished materials from sources of surface water by the construction of diversion drains, minimisation of stockpiles and covering of stockpiles; and
- The retention where possible of surface water on site, and the re-use of retained surface water (i.e. for dust control).

Surface water discharge will only occur from the site where water has been sampled and analysed and is found to have levels of impact in accordance with the relevant standards and guidelines.

An CEMP has been prepared for the works which includes procedures / measures which will be applied to both the demolition and remediation components to control potential surface water risks. The Plan also contains detail on appropriate guidelines and standards for water quality.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4.5 Groundwater Quality

The presence of contaminants in site groundwater has partially necessitated the site remediation works, and further influenced the design of the remediation works. The effect of the works comprising the removal of known contaminant source materials in areas of identified groundwater contamination, will have the effect of causing removing of the gross groundwater contaminants in these areas of the site.

No excavation works are proposed or otherwise permitted to extend of the depth of groundwater, precluding a requirement for dewatering. The reinstatement of the contaminated soils will be undertaken in a manner that precludes infiltration through the soils. As discussed in the Remedial Work Plan (**Appendix A**) this includes placement of the soils underlying areas of hardstand and/or provision of a geosynthetic clay liner (GCL) overlying the retained soils.

By prevention of further leaching of chlorinated ethenes from contaminated soils, and removal of the chlorinated ethene contaminated soils from the current area of groundwater impact, existing levels of chlorinated ethene sin groundwater will be anticipated to rapidly attenuate preventing any potential future groundwater risk.

4.6 Noise

There is a potential for noise emissions to occur during the remediation and demolition works. This potential relates to:

- Use of heavy machinery to undertake demolition works;
- Use of heavy machinery to excavate soils
- Break up of concrete paving on the site; and
- General site operation.

Noise emissions during particularly the demolition and pavement break up phases will be unavoidable during the works. The location of the site within an established retail area will mitigate the significance of some of the noise emissions. The area of the site is already characterised as a significant noise environment and the impacts from the site will be somewhat attenuated by the existing noise levels. It is further noted that the demolition / pavement break up phases of the project will occur over a relatively short duration which will further reduce the significance of the environmental emissions.

Measures are further available in the CEMP prepared for the site to reduce potential noise impacts (**Appendix H**). This includes provision of site hoarding in close proximity of high noise activities and inclusion of silencers / noise mitigation to noisy activities. Examples would include:

- Assessment of the condition of exhaust systems on the excavators / other heavy machinery to ensure that they are operating efficiently;
- Provisions of shrouds / enclosures to generators / pumps as used with the site works;
- Maintenance of a communication and complaints register to ensure that any concerns of local residents and members of the public are recorded and addressed; and
- Concerns over noise generation to be communicated to all site personnel and contractors during site inductions particularly noting the prevalent location of the site.

Work hours will further be restricted to times when the greatest levels of existing / background noise occur which will further mitigate the perceived impact of noise emissions.

A detailed Construction Noise & Vibration Management Plan is further provided in **Appendix K**.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4.7 Traffic

From the time of the late 1940's until currently the site has had a significant traffic generating potential. This has been by the continual movement of motor vehicles and associated product deliveries / pick-ups in and out of the site, ranging from passenger cars to large semi-trailers and B-doubles. Penrith has been an established highly urbanised area industrial area for at least 70 years and as a result has a significant inherent traffic generating potential. Consequently, the surrounding road network has been designed to cope with significant volumes of heavy vehicles.

The demolition works in particular, and the remediation works to a substantially reduced extent, have the potential to generate discrete, short-term, increased traffic volumes. This is related to the removal of demolition wastes and materials for recycling from the site. Heavy vehicle traffic may also be generated by the delivery of construction machinery to the site, and the delivery of small quantities of filling material as may be required during the remediation works. It is not envisaged that heavy vehicle traffic would exceed 20 movements in any one day, and is considered to be less than the current traffic generation of the current use of the site for a range of retail, services and commercial uses.

Of particular note potential traffic generation of the remediation stage of the works will be substantially reduced by a remedial approach adopted that retained contaminated soils on-site. Instead of 100's of heavy vehicle movements being generated by the transport of this material to landfill, a remedial method has been developed which allows these materials to be managed on-site in the future. Minimal traffic movements (beyond worker attendance and departure from the site) are anticipated to be generated by the remediation stage.

Heavy vehicles will be restricted to main roads only, travel along local roads will be eliminated where possible. Traffic routes, site entry and exit points will be stipulated in the CEMP as following the detailed design of the proposed works and by update of the document.

Traffic movement during the remediation works will be minimised by the treatment of impacted soils on-site.

4.8 Soil Quality

Soil quality on the site will be improved by the completion of the demolition and remediation works. Chlorinated ethene and asbestos impacted soils as currently distributed across the extent of the site will be excavated and consolidated in a central area of the site. The impacted soils will be retained within a purpose designed structure that will preclude potential exposure of human and ecological users of the site, and underlying groundwater, to impact as present within the soils. This will have the effect of improving soil quality across the site through:

- Localising contaminated soils to a smaller extent of the site, and re-instating with non-contaminated soils through the disposed locations of impact;
- Placement of non-impacted soils overlying the area of retained contaminated soils, facilitating exposure to better quality soils for human and ecological receptors on the site; and
- Facilitating the site development as City Park, which will include importation of specialised growing medias to support the extent of landscaping proposed.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4.9 Visual Amenity

Noting the established urbanised nature of the Penrith CBD and the confinement of stockpiling works associated with the remediation works to areas of the site not readily visible or otherwise significant set back from public roadways, the potential visual impact of the works is considered to be insignificant. It is noted that current visual amenity of the site inclusive of aged shopfronts and the Allen Place car park is most appropriately described as poor.

The CEMP as prepared for the site includes provision for screening to be provided to site fences to minimise potential visibility of the demolition and remediation works.

4.10 Hazards and Health Issues

The control measures to be implemented throughout the demolition and remediation works are designed to prevent adverse impacts to the health of on-site workers and the surrounding community. The strategy developed in the Remedial Work Plan (**Appendix A**) and Remediation Action Plan (**Appendix B**) to protect human health consist of five main elements, these include:

- Management controls such as the preparation and implementation of an Construction Environmental Management Plan and Health and Safety Plan;
- The approach taken to demolishing and remediating the site;
- The work procedures and control measures implemented;
- Monitoring the health of on-site workers; and
- Monitoring of the local environment both on-site and at site boundaries.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5. Legislative Requirements

5.1 Environmental Planning and Assessment Act 1979

The development proposed will be required to be assessed as per the relevant factors provided to section 4.15 of the *Environmental Planning and Assessment Act 1979*. The relevant factors are provided following:

4.15 Evaluation

(1) Matters for consideration—general In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application: …

…(1) (b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality, …

… (1) (e) the public interest.

The impacts of the development have been described in Section 4 of the SOEE and are considered to be acceptable. A net positive benefit will be generated by the remediation of environmental impact located on the site. It is further considered that it is the public interest that the site is demolished, remediated and made ready from an environmental perspective for a proposed redevelopment as City Park.

5.2 Environmental Planning and Assessment Regulation 2000

Schedule 3 provided to the *Environmental Planning and Assessment Regulation 2000* provides guidance as to the classification of development as designated development. The demolition and remediation of the site (where the demolition is being undertaken to facilitate the remediation and rehabilitation of the site) is most appropriately described in the Schedule as 'contaminated soil treatment works'. The requirement to designate a 'contaminated soil treatment works' is described following:

15 Contaminated soil treatment works

Contaminated soil treatment works (being works for on-site or off-site treatment of contaminated soil, including incineration or storage of contaminated soil, but excluding excavation for treatment at another site):

(a) that treat or store contaminated soil not originating from the site on which the development is proposed to be carried out and are located:

(i) within 100 metres of a natural waterbody or wetland, or

(ii) in an area of high watertable or highly permeable soils, or

(iii) within a drinking water catchment, or

(iv) on land that slopes at more than 6 degrees to the horizontal, or

(v) on a floodplain, or

(vi) within 100 metres of a dwelling not associated with the development, or

(b) that treat more than 1,000 cubic metres per year of contaminated soil not originating from the site on which the development is located, or

(c) that treat contaminated soil originating exclusively from the site on which the development is located and:

(i) incinerate more than 1,000 cubic metres per year of contaminated soil, or

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

(ii) treat otherwise than by incineration and store more than 30,000 cubic metres of contaminated soil, or

(iii) disturb more than an aggregate area of 3 hectares of contaminated soil.

The proposed development is not classified as designated development. The development is covered solely by part C of the designation. No incineration of soils will take place. A quantity well below 30,000m^3 of soils will be handled on the site, and the surface area of impacted soils is well below 3 hectares. Impacted soils are present in localised areas of the site.

5.3 Protection of the Environment Operations Act 1997

The *Protection of the Environment Operations Act 1997* provides guidance on the acceptable level of environmental emissions from a facility or site. As per the assessment provided to Section 4 of the SOEE, environmental emissions from the site will be minimised at all times, and controlled to levels required by the Act.

By a similar test described in **Section 5.2** for designated development, the demolition and remediation works do not require a licence under the Act.

5.4 Contaminated Land Management Act 1997

The site has not been assessed as being sufficiently contaminated by the NSW EPA that the site warrants notification under the *Contaminated Lands Management Act 1997*. Consequently the site is currently not impacted by the Act. The site will not be used for a more sensitive land-use (i.e. the City Park) development until such time that remedial works have been completed on the site.

However, a Site Auditor, accredited under s.50 of the Act will be engaged to prepare an anticipated statutory Site Audit Statement (anticipated requirement of development consent) as per s.47(2)(b) of the Act (a potential requirement as nominated in Section 5.13 of the SOEE). The Site Audit Statement will allow the site to be used for a range of potential beneficial uses. The Site Audit Statement will be furnished to PCC at the completion of the works.

5.5 Water Act 1912

The *Water Act 1912* contains guidelines for the protection and requirements to access of sub-surface waters (i.e. groundwater). There are no proposals to dewater, excavate to the depth of groundwater, or otherwise interfere with groundwater underlying the site. The Act does not apply to the works.

5.6 Waste Avoidance and Resource Recovery Act 2001

The *Waste Avoidance and Resource Recovery Act 2000* requires wastes to be treated as per a hierarchy of methods, with re-use, treatment and recycling being preferred ahead of waste disposal. Where possible, materials generated by the demolition works will be transported off-site for recycling. Where this is not possible, demolition materials will be transported to off-site recycling locations (i.e. scrap metal recyclers). Impacted soils are proposed to be retained on site and zero sum balance of soils as created by the excavation and filling works that will be undertaken to implement the proposed long-term management. The works have been designed so as to minimise the requirement for any off-site disposal.

5.7 Protection of the Environment Operations (Clean Air) Regulation 2010

The *Protection of the Environment Operations (Clean Air) Regulation 2002* provides standards for discharge of air impurities from plant and equipment and guidelines for the scheduling of plant and equipment. There is no fixed plant provide don the site and this Regulation does not strictly apply to the works. Notwithstanding provisions have been advised through the SOEE and in the CEMP as prepared for the works to ensure that air emissions form the site are reduced to the extent practicable.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5.8 Protection of the Environment Operations (Waste) Regulation 2014

The *Protection of the Environment Operations (Waste) Regulation 2014* makes requirements relating to non-licensed waste activities and waste transporting. The proposed works on the site will not require to be licensed. Section 48 of the Regulation requires that wastes are stored in an environmentally safe manner. It is also stipulated that vehicles used to transport waste must be covered when loaded. Part 7 of the Regulation applies specifically to asbestos waste as will be generated by the proposed demolition works. Consistent with the requirements of the CEMP asbestos waste shall require a formal tracking system to be implemented.

5.9 State Environmental Planning Policy 11 – Traffic Generating Development

State Environmental Planning Policy (SEPP) 11 provides for the Roads and Traffic Authority to comment on traffic generating developments. The development as proposed has the potential to generate minor amounts of traffic. Traffic will only be consequent of the removal of materials from the site, and will occur for the duration of the works. Traffic will be restricted to main roads. It is noted that only enlargement or extension to existing facilities nominated within the Schedule provided to the SEPP. It is not proposed to enlarge or extend the terminal. Thus SEPP 11 does not apply to the development.

5.10 State Environmental Planning Policy 33 – Hazardous and Offensive Industries

State Environmental Planning Policy (SEPP) 33 provides a framework for the merit based assessment of potentially hazardous and offensive industry. DUAP (1997) 'Applying SEPP 33, 2nd Edition' provides guidelines for determining as to whether SEPP 33 applies to a development. This is undertaken as per a screening procedure.

It is found that SEPP 33 does not apply to the development. The development does not require any pollution control licences. The development is not considered to be potentially hazardous as per Table 3 and Figure 9 of DUAP (1997) – as no fuel storage or handling is specifically required for this development consent.

5.11 State Environmental Planning Policy 55 – Remediation of Land

State Environmental Planning Policy (SEPP) 55 facilitates control over the remediation of contaminated land. A process is provided in s.9 provided to the SEPP to define whether remediation work is classified as a Category 1 or 2 remediation. The remedial works would potentially be classified as Category 2 works, however the demolition works as required to be undertaken to allow the remediation works to be implemented require development consent. On this basis the remedial works have been prepared as Category 1 works and have been addressed in this development application.

5.12 Sydney Regional Environmental Plan 20 – Hawkesbury – Nepean River 1997

The site is located within the sub-catchment boundary as advised in the maps provided to the Regional Environmental Plan (REP). The site is located outside of the extent of the boundary of application of the REP. Potential impacts to waterways in proximity of the site have been considered in the assessment to the SOEE and measures are available to eliminate / mitigate any potential impacts.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5.13 Penrith Local Environmental Plan 2010

The site is located within an area zone B3 and RE1 as per the Local Environmental Plan (LEP). The objectives of the RE1 zone include:

- To enable land to be used for public open space or recreational purposes;
- To provide a range of recreational settings and activities and compatible land uses;
- To protect and enhance the natural environment for recreational purposes;
- To ensure that development is secondary and complementary to the use of land as public open space, and enhances public use, and access to, the open space; and
- To provide land for the development of services and facilities by public authorities for the benefit of the community.

The objectives of the B3 zone include:

- To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community;
- To encourage appropriate employment opportunities in accessible locations;
- To maximise public transport patronage and encourage walking and cycling; and
- To strengthen the role of Penrith City Centre as the business, retail and cultural centre of the region.

The completion of the demolition and remediation works will allow the construction of the City Park, which consistent with the project description as provided to **Section 2.5**, will allow the use of the site to meet the relevant objectives of the RE1 and B3 zones.

Environmental protection works are permissible with development consent under these zonings. Notwithstanding specific classifications to SEPP 55, the remedial works would be most appropriately described as environmental protection works.

5.14 Penrith Development Control Plan 2014

Section C4 Land Management of the Penrith Development Control Plan 2014 (DCP) provides a general objective of minimisation of land contamination through inappropriate landfill or pollution of land and maximisation of remediation of contaminated land. This will be achieved by the implementation of the demolition and remediation works proposed here.

A range of requirements for contaminated land are provided to Section 4.4. of the DCP. These have been addressed as detailed through this SOEE inclusive of:

- Completion of contamination assessments / investigations (included as **Appendices D** to **G** and summarised in **Section 3.15**);
- Appointment of a Site Auditor as accredited under the CLM Act and Site Audit of contaminated site documents. The most recent Site Auditor advice, which is an independent review of the proposed remedial plans, is provided as **Appendix J**;
- Preparation of a Remedial Work Plan and Remedial Action Plan as provided as **Appendix A** and **B** respectively;
- Monitoring of remedial works is proposed through validation procedures to the remedial plans and further detailed within the CEMP (provided as **Appendix H**); and
- It is proposed to prepare a Validation Report at the completion of the remedial works as detailed in the Remedial Work Plan and Remedial Action Plan as provided as **Appendix A**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

and **B** respectively. A long-term Environmental Management Plan to ensure the maintenance of the validated condition of the site has been further prepared as a draft and is included as **Appendix I**.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6. Conclusions and Recommendations

A range of previous site investigations have identified that soils on the site are subject to levels of environmental contamination that restrict the site's proposed future use as City Park. The proposed demolition and remediation works will address the extent of contaminated soils present on the proposed City Park site to make the site environmentally suitable for a future redevelopment as City Park.

The development has been found to be permissible, with development consent from Penrith City Council. In accordance with the limitations provided as **Section 7** a range of potential environmental emissions have been identified with the completion of the works. However where control / monitoring methods as detailed in the Remedial Works Plan and Construction Environmental Management Plan are implemented these impacts can be managed to level to not pose an unacceptable environmental impact to the surrounding community. The site will require to be managed in accordance with the draft Long-Term Environmental Management Plan following the remedial works.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

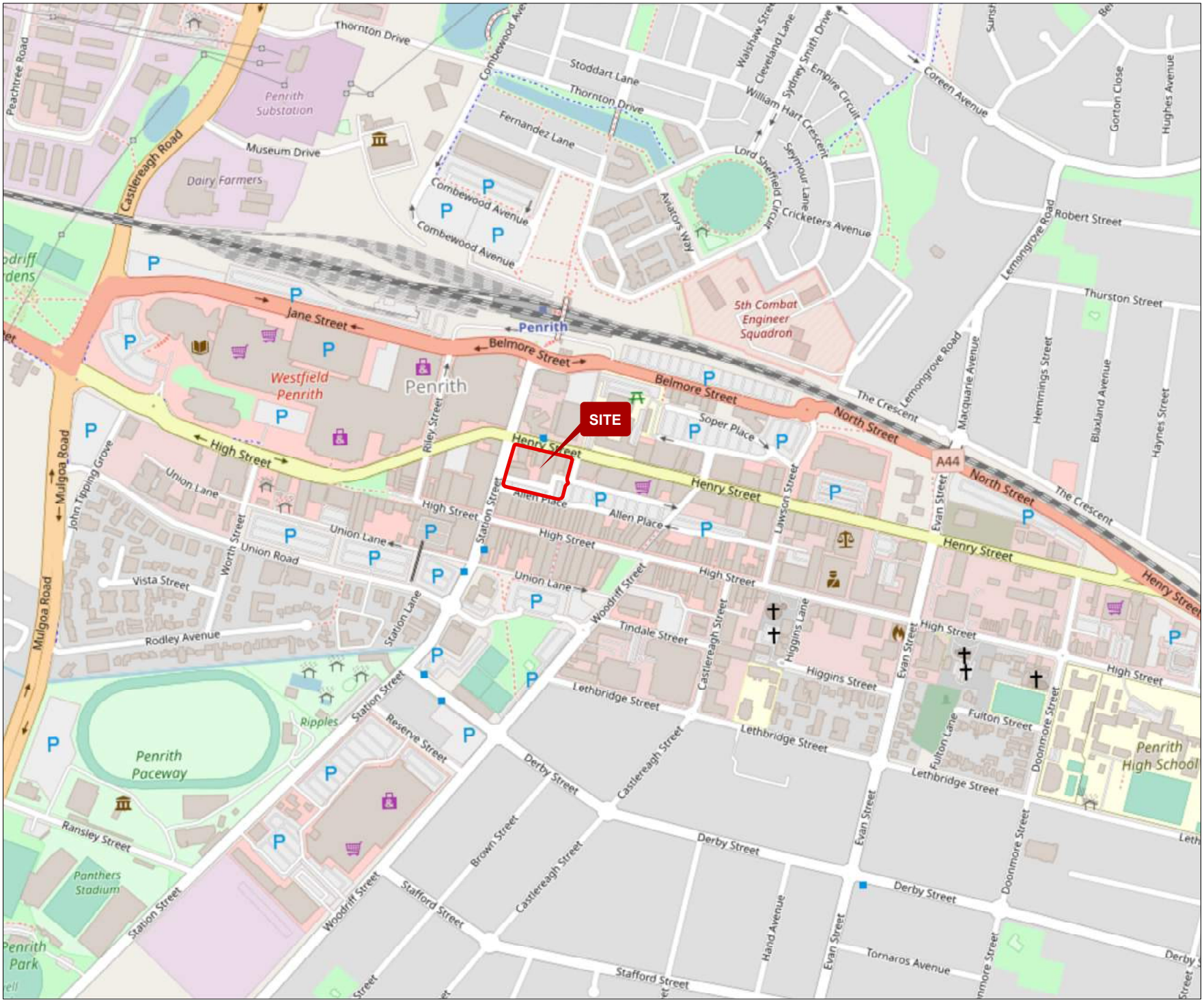
Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figures

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



Legend:

Approximate Site Boundary

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R04 Rev A	Date: 03-Dec-2020
Drawn By: RF/RH	Checked By: CB

Scale 1:8,500

0 100 200

metres

Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SITE LOCATION

FIGURE 1

Reference: © OpenStreetMap (and) contributors, CC-BY-SA

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Version: 1, Version Date: 14/04/2021

Legend:

- Project Boundary of Previous Investigations
- Approximate Site Boundary
- Cadastre (NSW LPI, 2019)
- Site Features Polygon
- Sewerage Infrastructure / Preferential Pathway

Areas of Environmental Concern

- AEC 1- Dry Cleaners Location
- AEC 2 - Former Service Station Location
- AEC 4 - Transformer

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R05 Rev 0	Date: 03-Dec-2020
Drawn By: JA/RH	Checked By: CB

Scale 1:600

0 7.5 15

metres

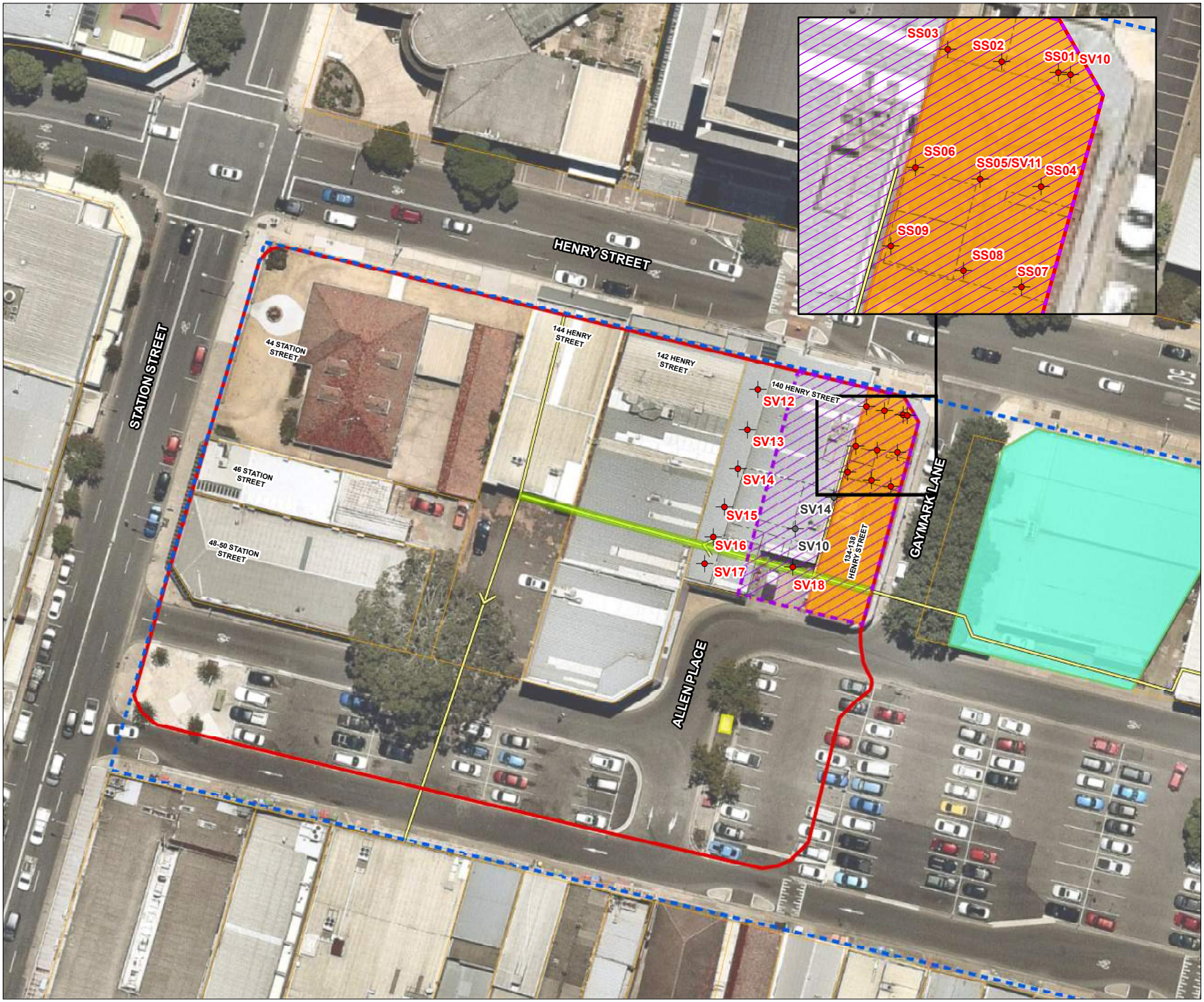
Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SITE LAYOUT

FIGURE 2

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



Legend:

- Approximate Site Boundary
- Cadastre (NSW LPI, 2019)

Type

- Inferred Remedial Extent
- Potential Remediation - Sewer Trench
- Project Boundary of Previous Investigations
- Sewerage Infrastructure / Preferential Pathway
- Site Features

Areas of Environmental Concern

- AEC 1- Dry Cleaners Location
- AEC 2- Former Service Station Location
- AEC 4 - Transformer
- Sample Location (JBS&G 2019)
- Sample Location (JBS&G 2020)

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R05 Rev 0	Date: 03-Dec-2020
Drawn By: JA	Checked By: CB

Scale 1:750

0 10 20

metres

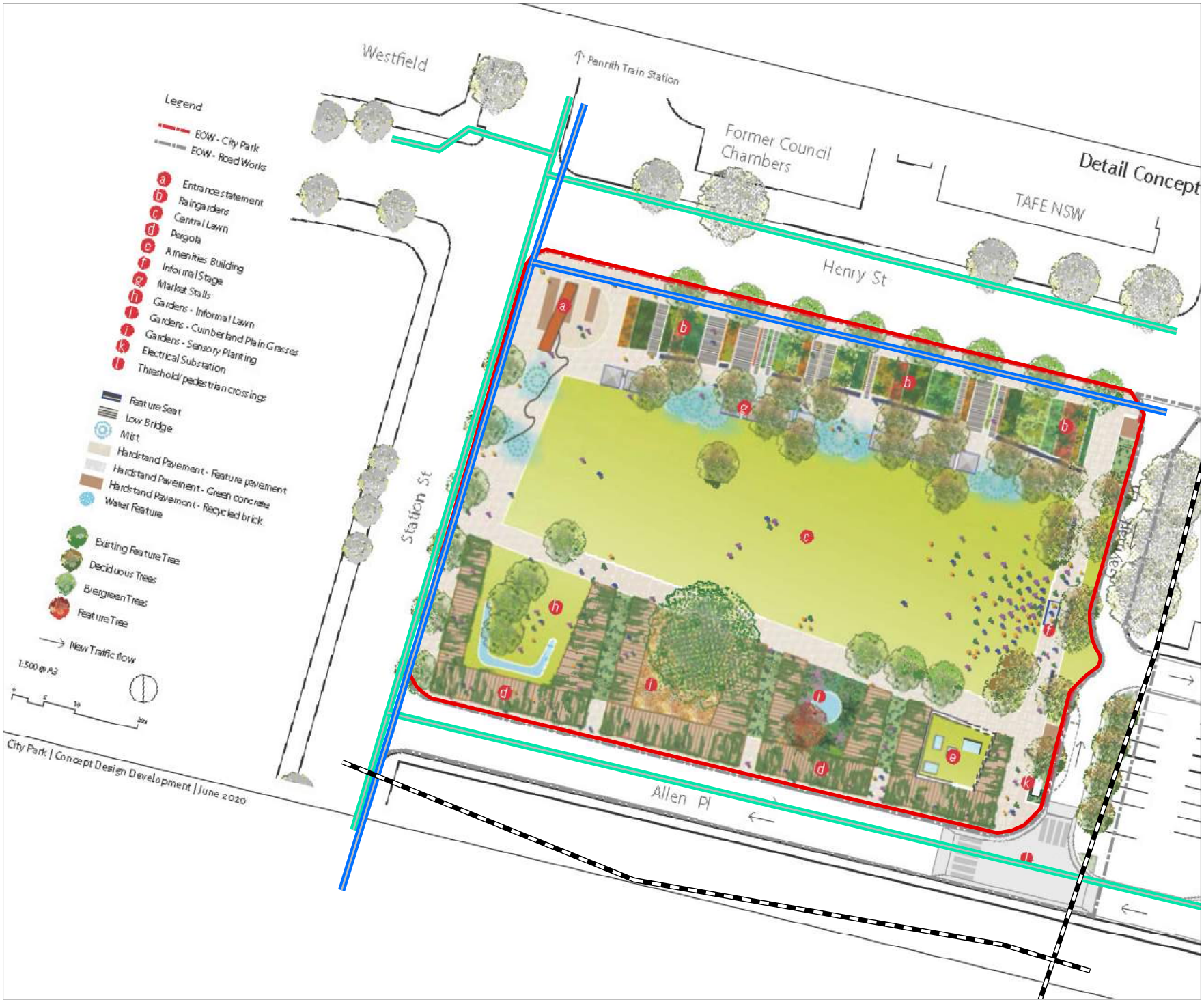
Coor. Sys. GDA 1994 MGA Zone 56

48-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SAMPLE LOCATIONS AND REMEDIAL EXTENT

FIGURE 3

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



Legend:

Approximate Site Boundary

Proposed Utilities

Gas Main

Sewer

Water Main

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R05 Rev 0	Date: 04-Dec-2020
Drawn By: JA/RH	Checked By: CB

Scale 1:800

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

PROPOSED SITE LAYOUT AND UTILITIES

FIGURE 4

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Approximate Site Boundary

Proposed Utilities

- Gas Main
- Sewer
- Water Main

Suitable Area for Containment Cell

- >30m from Structures, >1m from Utilities

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R05 Rev 0	Date: 04-Dec-2020
Drawn By: JA/RH	Checked By: CB

Scale 1:800

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SUITABLE AREAS FOR CONTAINMENT CELL

FIGURE 5

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix A Remedial Works Plan

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Penrith City Council
Penrith Central Park Village

DRAFT Remedial Work Plan

134 to 144 Henry Street,
42 to 50 Station Street,
and Allen Place Car Park

8 December 2020

58140/132,003 (Rev B)

JBS&G Australia Pty Ltd

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Version: 1, Version Date: 14/04/2021

Penrith City Council

Penrith Central Park Village

DRAFT Remedial Work Plan

134 to 144 Henry Street,
42 to 50 Station Street,
and Allen Place Car Park

8 December 2020
58140/132,003 (Rev B)
JBS&G Australia Pty Ltd Australia Pty Ltd

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table of Contents

Abbreviations v

1. Introduction 6
   - 1.1 Background 6
   - 1.2 Objectives 6
     - 2.2.1 The Dry Cleaner, 134-138 Henry Street, Penrith 7
     - 2.2.2 Shop 3, 140 Henry Street, Penrith 7

3. Responsibilities 9
   - 3.1 Client Supervisor / Manager 9
   - 3.2 Remediation Contractor 9
   - 3.3 Environmental Consultant 9

4. Contamination Issues Requiring Remediation 10
   - 4.1 Fill Material Underlying Buildings (AEC4) 10
   - 4.2 Chlorinated Ethene Impacted Soils (AEC1) 10
   - 4.3 Soils Underlying Transformers (AEC3) 11

5. Remediation Methodology 12
   - 5.2 Chlorinated Ethene Impacted Soils (AEC1) 12
     - 5.2.1 Management of Underground Utilities 12
     - 5.2.2 Excavation and Stockpiling of Impacted Soils 13
     - 5.2.3 On-site Containment 13
   - 5.3 Soils Underlying Transformers (AEC3) 13
   - 5.4 Materials Management Principles 14

6. Validation Plan 15
   - 6.1 Validation Sampling and Analysis 15
     - 6.1.1 Potential Impacted Fill Soils (AEC4) 15
     - 6.1.2 Chlorinated Ethene Impacted Soils (AEC1) 15
     - 6.1.3 Soils Underlying Transformers (AEC3) 16
     - 6.1.4 Validation of Soil Containment 16
   - 6.2 Validation Reporting 17
   - 6.3 Long Term Environmental Management Plan 18

7. Conclusion 20

8. Limitations 21

List of Tables

Table 2.1: Summary Site Details 7

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figures

Figure 1 Site Location
Figure 2: Site Layout
Figure 3 Remediation Areas
Figure 4 Proposed Site Layout
Figure 5 Containment Cell Area

Appendices

Appendix A Bentofix Product Specifications

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Abbreviations

Term	Definition
ACM	Asbestos Containing Material
AEC	Area of Environmental Concern
AHD	Australian Height Datum
B(a)P	Benzo(a)pyrene
bgs	below ground surface
BTEX	Benzene, toluene, ethylbenzene and xylenes
CE	Chlorinated Ethenes
CEMP	Construction Environmental Management Plan
COPC	Contaminant of Potential Concern
CSM	Conceptual site model
DCA	Dichloroethane
DCE	Dichloroethene
DEC	NSW Department of Environment and Conservation
DECCW	NSW Department of Environment, Climate Change and Water
DP	Deposited Plan
DQI	Data quality indicator
DQOs	Data Quality Objectives
ENM	Excavated Natural Material
EPA	NSW Environment Protection Authority
GCL	Geosynthetic Clay Liner
ha	Hectare
HASP	Health and Safety Plan
HIL	Health based investigation level
JBS&G	JBS&G Australia Pty Ltd
LOR	Limit of Reporting
LTEMP	Long Term Environmental Management Plan
MAH	Monocyclic Aromatic Hydrocarbon
OCP	Organochlorine Pesticide
OEH	Office of Environment and Heritage
PAHs	Polycyclic aromatic hydrocarbons
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethene
PCPV	Penrith City Village Park
PID	Photo-ionisation Detector
PQL	Practical Quantitation Limit
PVC	Poly Vinyl Chloride
QA/QC	Quality Assurance/Quality Control
RAP	Remedial Action Plan
RPD	Relative Percentage Difference
RWP	Remedial Work Plan
SAQP	Sampling, Analysis and Quality Plan
SAR	Site Audit Report
SAS	Site Audit Statement
TCA	Trichloroethane
TCB	Trichlorobenzene
TCE	Trichloroethene
TPH	Total Petroleum Hydrocarbons
TPH	Total Petroleum Hydrocarbons (C_6-C_9 and C_{10}-C_{36})
VC	Vinyl chloride
VENM	Virgin Excavated Natural Material
VOC	Volatile Organic Compound

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1. Introduction

1.1 Background

JBS&G Australia Pty Ltd (JBS&G) was engaged by Penrith City Council (Council, the client) to provide environmental consultancy services associated with the proposed redevelopment of the Penrith City Village Park (PCPV). It is understood that the client is proposing to develop the western portion of PCPV (herein, referred to as the 'site') for contemporary public open space. The site area is shown on **Figures 1** and **2**. In addition, the address and legal identification of each property within the site is provided in **Table 2.1**.

An overarching Remedial Action Plan (RAP) (JBS&G 2019a[1]) for the broader PCPV site (as defined by the blue dashed line on **Figure 2**) was previously prepared to facilitate feasibility planning and costing for the overall development. Upon development of detailed design plans and establishment of project staging, remedial work plans (RWPs) were intended to be prepared to facilitate the staged remediation of specific portions of the PCPV site. This RWP has been prepared for the site (western portion of PCPV) with consideration to the RAP (JBS&G 2019a) and the findings of a pre-remediation investigation (JBS&G 2020[2]), in which the nature and extent of environmental impacts was further delineated by an additional soil and soil vapour sampling program.

Taking into consideration that the objectives of any remedial works and environmental management procedures set out in the RAP (JBS 2019a) are still valid, this RWP has been prepared to detail the contaminated soil remediation / management requirements during site redevelopment, consistent with the preferred scope and method of remediation documented in the RAP (JBS&G 2019a) as specific to the site area shown on **Figures 1** and **2**.

1.2 Objectives

The objectives of the RWP are to:

- Detail the works required to remove and/or manage the identified soil contamination to render the site suitable for the proposed use, in accordance with relevant guidelines, the existing RAP (JBS&G 2019a) and the refined remedial extent as advised by JBS&G (2020b); and
- To document validation measures to enable validation of remediation works consistent with current EPA endorsed guidance.

It is noted that this RWP will be revised upon receipt of the additional investigation results proposed to be completed prior to remediation works as outlined in JBS&G (2020). The remedial works outlined herein have been presented to facilitate remedial works planning.

[1] *Overarching Remedial Action Plan*, Penrith Central Park Village, 114 to 146 Henry Street, 42 to 50 Station Street and Allen Place Car Park, JBS&G Australia Pty Ltd, 5 March 2019 (JBS&G 2019a).

[2] Pre-Remediation Investigation, Penrith Central Park Village, 114 to 146 Henry Street, 42 to 50 Station Street and Allen Place Car Park, JBS&G Australia Pty Ltd, 31 August 2020 (JBS&G 2020)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2. Site Condition and Surrounding Environment

2.1 Site Identification

The site location is shown on **Figure 1**. The extent of the site and associated cadastral boundaries are shown on **Figure 2**. The site details are summarised in **Table 2.1** and described in detail in the following sections.

Table 2.1: Summary Site Details

Property Identification and Street Addresses	The site is comprised of the following legal properties: • Lot 1 in DP 164798 and Lot 1 in DP 252457 – 134 to 138 Henry Street • Lot 10 and 11 in DP 553665 – 140 to 142 Henry Street • Lot 2 in DP 556075 – 144 Henry Street • Lot 3 in DP1200790 – 42 to 44 Station Street • Lot 1 in DP 526304 – 48 to 50 Station Street • Lot E in DP 163176 – 46 Station Street In addition, the site area includes portions of the Allen Place Car Park.
Local Government Authority	Penrith City Council
Approximate MGA Coordinates (MGA 56)	Easting: 286582.2 Northing: 6262912.7
Site Zoning	Commercial Core (B3) and Public Recreation (RE1) under Penrith Local Environmental Plan (LEP) 2010
Current Use	Commercial (car parking, retail and services)
Previous Use	Commercial/industrial (car parking, dry cleaning and general retail/services) and residential
Proposed Use	Public open space
Site Area	Approximately 0.71 ha

2.2 Site Description

The key features from the areas that form the focus of this pre-remediation investigation are discussed in the following sections and shown on **Figure 3**. Observations were made by an experienced JBS&G consultant on 18 May 2020 during an inspection of accessible areas of the site.

2.2.1 The Dry Cleaner, 134-138 Henry Street, Penrith

The former dry cleaner comprised the northern third of the building (referred to as Shop 3, Gaymark Lane) located at 134-138 Henry Street, Penrith. The shop-front occupied most of the building footprint (>85 %), with the remainder comprising a secluded water closet, storage space and point of sale. The premise was vacant during the period of the investigation.

The water closet comprised a small (<3 m^2), fully enclosed space which was serviced by two separate sewerage disposal points. Detergents, household solvents and soaps were observed to be stored within the water closet. The shop-front was serviced by an air exchange (air-conditioning) unit which was observed to be operational during each visit to the premises.

In the alleyway between the dry cleaner and Shop 3 (140 Henry Street, described below), numerous services were present. Sewerage infrastructure and stormwater pipes ran in a north to south orientation, connecting stormwater and sewerage pipes to the greater system, south of the premises. Services were noted to comprise a mixture of terracotta and polyvinyl chloride (PVC) pipes.

The southern portion of 134-138 Henry Street was inaccessible during the period of the investigation, in which it is noted a café was operating.

2.2.2 Shop 3, 140 Henry Street, Penrith

None of the building spaces located on 140 Henry Street were accessible during the period of the investigation due to business/tenants still operating. Therefore, the observations described below

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

are based on an inspection by a suitably qualified and experienced JBS&G environmental consultant conducted on 3 May 2018 and detailed in the RAP (JBS&G 2019a).

Shop 3 comprised the southern half of the building located at 140 Henry Street, Penrith. The shop was partitioned into four rooms and a water closet, joined by a central hallway. The premises housed an alternative health centre at the time of the inspection.

The shop-front rooms were serviced by air exchange units (air conditioners) which were observed to be in operation during each site visit. The water closet comprised a small (<5 m^2), fully enclosed space which was serviced by two separate sewerage disposal points.

An inspection of the property revealed the presence of household cleaning and medical products: limescale solvents, surface cleaners, stain removers, methylated spirits, polishes, pest control products, ethanol-based surface wipes and carpet deodorisers.

2.3 Environmental Setting

A detailed review of the environmental setting at the site is provided in the RAP (JBS&G 2019a) and pre-remediation investigation (JBS&G 2020) and is therefore not repeated herein.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3. Responsibilities

3.1 Client Supervisor / Manager

The client supervisor/manager is responsible for:

- Ensuring all works are compliant with a future development approval;
- Providing direction to the remediation contractor and environmental consultant; and
- Community consultation as required.

3.2 Remediation Contractor

The remediation contractor is responsible for:

- Ensuring all works are undertaken as per the RAP (JBS&G 2019a), this RWP, and in accordance with appropriate instruction from the client supervisor/manager and environmental consultant;
- Ensuring all works are undertaken in accordance with appropriate regulations and standards;
- Preparation of a health and safety plan (HASP) to document controls and monitoring to eliminate/minimise potential occupational risks to the site workforce. Ensuring all works are undertaken as per the health and safety plan and ensuring a copy of the health and safety plan is available at the site during the remediation/validation activities;
- Preparation of a Construction Environmental Management Plan (CEMP) to detail how potential emissions from the remediation works will be managed/mitigated and minimise potential exposures of the adjoining community. Undertaking all works in accordance with the requirements of the CEMP;
- Confirming individuals are inducted to the HASP, CEMP and are aware of the requirements of these documents as well as ensuring they are competent in performing allotted tasks;
- Liaison with the client supervisor/manager and contractor representatives, as appropriate, regarding safety matters;
- Maintaining communication with the adjoining community and provision of all remedial data as necessary to Council to facilitate community consultation processes; and
- Investigation and reporting of incidents and accidents.

3.3 Environmental Consultant

The environmental consultant is responsible for:

- Undertake remediation and validation sampling as per the RAP (JBS&G 2019a) and this RWP;
- If required, undertake air quality monitoring as consistent with the provisions of an air quality management plan to assess potential emissions from the remediation works and the associated risks to site workers and the adjoining community;
- Ensuring consultant works are undertaken as per the relevant health and safety plan;
- Liaison with the contractor representatives, as appropriate; and
- Provision of monitoring and/or validation data to the client as necessary to inform community consultation.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4. Contamination Issues Requiring Remediation

Soil remediation works are required to be conducted in accordance with Section 7 of the RAP (JBS&G 2019a).

4.1 Fill Material Underlying Buildings (AEC4)

Fill materials underlying buildings have not yet been appropriately assessed and may require management/remediation during development works.

Based on the available data, it is anticipated that potential impacts within fill materials are most likely to comprise of asbestos, where it is noted that asbestos impacted fill-based soils have previously been identified on PCPV. However, the degree of asbestos impacts in soils has not been comprehensively assessed within the extent of the site and therefore the extent of required remediation (if any) to manage asbestos in soil impacts is not yet known. As site demolition occurs and concrete slabs are progressively removed across the site, the extent of asbestos impacts (as well as other contaminants of potential concern (COPCs)) in fill-based soils will need to be assessed by the environmental consultant to determine if management of the materials is required. A sampling plan outlining the proposed scope and methodology of the assessment will be submitted to the Site Auditor for review and endorsement prior to commencement of the investigation works.

4.2 Chlorinated Ethene Impacted Soils (AEC1)

Chlorinated ethene (CE) impacted soils underlying 134-138 and 140 Henry Street require management to be protective of future off-site receptors in basements/buildings to the east (within the PCPV development) and removal of on-going source material to groundwater impacts.

The final remedial extent relating to CE impacted soils has not yet been defined due to tenants currently occupying the majority of commercial spaces within the area of concern. Preliminary data as presented in JBS&G (2020) identified elevated levels of tetrachloroethylene (PCE) and trichloroethylene (TCE) in sub-slab vapour at all locations underlying Shop 3 Gaymark Lane (as represented by SS01 to SS09). In addition, elevated levels of TCE and PCE were reported at historical sub-slab vapour sample locations SV10 and SV14 as collected by JBS&G in previous sampling events. Conversely, the levels of TCE and PCE within samples at SV12 to SV18 were below laboratory detection limits, providing evidence that soil vapour has not migrated to this lateral extent. On this basis, the inferred lateral extent of CE impacted soils acting as potential source material (to soil vapour) is shown on **Figure 3** – equating to an area of approximately 650 m^2. It is noted that the lateral source material extent has been conservatively included to comprise of the area around SV18 and extending west towards SV12-SV17 and east towards Gaymark Lane, where limited data has been collected to date.

To inform the likely depth of CE source material, JBS&G installed soil vapour probes at depths of 1 m and 4 m at locations SV10 and SV11. At both locations, elevated levels of TCE and PCE were detected in the shallow probe (1 m) but below detection limits in the deeper probes (4 m). This data provides evidence that the low permeability clay soils at the site have retarded the vertical migration of these impacts at the site. This is concordant with the visually observed depth of more permeable fill material overlying residual clays and the detection of PCE within the shallow soil sample SV11 0.2-0.3 (2.2 mg/kg) that was in turn, reported at below detection limits in all underlying soil samples. An estimated excavation depth of 1.5 m bgs is provided on this basis, noting that the depth of fill may vary between and surrounding investigation locations. Based on the current data and associated limitations, an inferred lateral area of 650 m^2 over an average excavation depth of 1.5 m and assuming a contingency factor of +50% for depth and/or lateral variation equates to an approximate volume of 1,500 m^3 in-situ potentially requiring remediation.

However, to date, the location where chlorinated hydrocarbon impacts have historically migrated from the shallow soils to underlying groundwater (that is approximately 7 m below ground surface)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

has not been determined - noting that the inferred vertical remediation depth of 1.5 m bgs has been informed by only two deep soil vapour probes within a limited area as well as depths of more permeable fill materials in the source area.

Based on the potential that the former site operator may have disposed of dry-cleaning fluids either down the sewer or stormwater drains, the greatest impacts are expected within the trenches of these underground utilities that extend from the property. Therefore, the remediation works outlined herein, designed to remove the CE impacted soils acting as on-going source material, will be required to remediate any impacted soils identified within underground trenches associated with these utilities within the site extent.

4.3 Soils Underlying Transformers (AEC3)

As noted in the RAP (JBS&G 2019a), soils underlying the transformer in the south-eastern portion of the site have not been assessed. During decommissioning of the transformer and subsequent removal of hardstand, the extent of potential impact to underlying soil will need to be assessed to in accordance with Section 7.6.3 of the RAP (JBS&G (2019a) in order to determine if remediation and/or management of the materials is required. A sampling plan outlining the proposed scope and methodology of the assessment will be submitted to the Site Auditor for review and endorsement prior to commencement of the investigation works.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5. Remediation Methodology

As consistent with the RAP (JBS&G 2019a), the preferred remediation methodologies for impacted soils outlined herein were developed in accordance with The *Contaminated Land Management: Guideline for the NSW Site Auditor Scheme* (EPA 2017[3]) and ecologically sustainable development (ESD) principles as detailed in the following sections.

5.1 Potential Impacted Fill (AEC4)

As per **Section 4.1**, it is anticipated that potential impacts within fill materials are most likely to comprise of asbestos. Should other contaminants be identified within fill based soils that require management, then the remedial screening options outlined in the RAP (JBS&G 2019a) will require review. The preferred remediation approach will require approval by the site Auditor prior to implementation.

The remediation methodology for potential asbestos impacts will be dependent upon the nature of the impacts and the preferred management approach. This will be determined following the assessment of the type and extent of asbestos impacts at the site.

Based on historical investigations completed at the site, it is not anticipated that widespread asbestos impacts will be encountered at the site. On this basis, any asbestos impacts will likely be localised in which the preferred remedial methodology will comprise excavating the impacted soils to the extent directed by the environmental consultant where validation is achieved. As consistent with the RAP (JBS&G 2019a), any excavated asbestos impacted soils will then be managed via containment and the implementation of physical separation or within a "Capping Layer", which eliminates the direct contact exposure pathway for impacted soils. The hardstand to be constructed as part of the site development works will act as a capping layer where present across the site. In proposed grassed/vegetated areas and service trench alignments, the minimum requirements for the physical separation to be adopted in the remediation of the site include:

- Marker Layer - comprising a bright orange geotextile, such as "Bidim" or similar geotextile, is to be installed prior to placement of the capping layer. The marker layer is required to be easily recognisable in soils (i.e., bright orange in colour), be durable as a long term marker layer (i.e., >150 grams per square metre) and maintain integrity during remedial/civil works.
- Capping Layer - A minimum 1.0 m (after compaction) capping layer of soil capping material / thickness is required to manage access to asbestos impacted soils across the areas subject to containment. Material imported to site for use as a capping layer will be required to be environmentally suitable material for human and/or ecological exposure (as appropriate). Imported material shall comprise imported virgin excavated natural material (VENM) or material certified in accordance with an exemption issued by the NSW EPA (i.e. ENM, recycled fines etc) and the RAP (JBS&G 2019a).
- Should services extend through asbestos impacted soils, then they will be required to be placed in dedicated alignments, demarcated (with a marker layer at the base and walls of the trench) and backfilled with clean material to avoid exposure to underlying impacted material during subsequent maintenance or excavation work.

5.2 Chlorinated Ethene Impacted Soils (AEC1)

5.2.1 Management of Underground Utilities

Noting that CE impacted soils are anticipated to be present within service trenches (particularly sewer and stormwater) underlying 134-138 and 140 Henry Street, the first step in the remediation of

[3] *Contaminated Land Management: Guideline for the NSW Site Auditor Scheme (3ed Edition). NSW EPA 2017 (EPA 2017)*

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

CE impacted soils will comprise the decommissioning of all underground utilities within the remediation area, in order to allow remedial excavation works to proceed.

5.2.2 Excavation and Stockpiling of Impacted Soils

The second step of remediation works will be the excavation of CE impacted materials to be conducted by the contractor. The anticipated lateral extent of the required remedial excavation is presented on **Figure 3**. The vertical extent of remedial excavations is anticipated to extend to an average depth of 1.5 m bgs, although deeper excavations are anticipated in areas of greater impact (i.e. potentially within service trench easements).

The excavated impacted soils will then be temporarily placed in 70 m^3 stockpiles in accordance with Sections 7.6.4 and 8.2.6.6 of the RAP, pending further assessment by the environmental consultant for suitability for on-site containment in accordance with **Section 6.1.2**. Should the materials be assessed as non-suitable for on-site retention, they will be disposed off-site in in accordance with **Section 5.4** and Section 8.7.2 of the RAP. All excavated materials will be subject to suitable materials tracking in accordance with Section 7.6.9 of the RAP.

5.2.3 On-site Containment

CE impacted materials assessed as suitable for on-site retention will be consolidated into a single stockpile prior to final placement within an on-site containment cell. The containment cell will be located at least 30 m lateral distance away from current and future on and off-site structures (to preclude the potential for vapour intrusion) and located above the groundwater table (approximately 7 m bgs) to mitigate any on-going risks to groundwater. In addition, the containment cell will be located under future hardstand or placed under a geosynthetic clay liner (GCL) with a hydraulic conductivity of less than 5 x 10^{-11} m/s (as consistent with the product specifications of Bentofix, provided in **Appendix A**) to further mitigate any on-going risks to groundwater. The approximate location of the containment cell is shown on **Figure 5**, however its final location will be informed by the volume of materials that require containment – where it is noted, that the containment cell cannot intercept existing/future underground service corridors/easements. In addition, the containment cell will be required to be suitably capped (in areas not covered in hardstand) as per the following specifications:

- Impermeable Layer – in areas not covered in hardstand, the materials subject to containment will be required to be covered with a GCL layer with a hydraulic conductivity of less than 5 x 10^{-11} m/s. The GCL layer is required to be installed in accordance with the manufacturer's instructions with appropriate overlay of 150-300 mm between joints of the GCL. Care should be taken to ensure that there are no cuts/abrasions during installation of the GCL – however it is noted that the product is self-healing and minor cuts/openings will appropriately ameliorate. In addition, Bentofix does not require to be kept moist during installation and/or maintenance.
- Marker Layer – above the impermeable GCL layer, a single bright orange orange geotextile, such as "Bidim" or similar geotextile, is to be installed (as per Section 5.1) prior to placement of the capping layer as per **Section 5.1**.
- Capping Layer - A minimum 1.0 m (after compaction) capping layer of soil is required to manage access to impacted soils subject to containment. Material imported to site for use as a capping layer will be required to be environmentally suitable material for human and/or ecological exposure (as appropriate) as per **Section 5.1**.

5.3 Soils Underlying Transformers (AEC3)

The remediation methodology (if required) for potentially impacted soils underlying the transformer in the south-eastern portion will be dependent upon the nature and extent of soil impacts identified following decommissioning and removal of the transformer. The preferred remediation approach

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

will require consideration to the remedial options presented in the RAP (JBS&G 2019a) and further require approval by the Site Auditor prior to implementation.

5.4 Materials Management Principles

As part of site remediation/construction works it is anticipated that excavated material required to be removed from the site during construction/remediation works will fall into one of a number of categories, comprising material:

- Required to be removed from the site as a result of contaminant characteristics identified as presenting an unacceptable risk to human health or the environment (source material assessed as unsuitable for on-site containment) under the proposed development. Such material is characterised as having contaminant characteristics that present an unacceptable risk to future receptors under the proposed land-use and so will require disposal to a lawful waste facility.

  Material identified as requiring removal from the site must be disposed of off-site to a facility lawfully able to receive it. Materials shall be classified in accordance with NSW EPA Waste Classification Guidelines (EPA 2014) requirements or an appropriate exemption as created under the *Protection of the Environment Operations (Waste) Regulation 2015*.

  Details of completed additional assessment activities including material characterisation reports will be included in the final validation documentation to be prepared in accordance with the requirements of the RAP JBS&G (2019a). Records associated with material tracking, including trucking receipts, landfill disposal records, etc will also be reviewed to ensure material removed from the site can be accounted for and has been disposed of lawfully.

  or

- Required to be removed to achieve site development objectives which will most likely comprise surplus materials excavated to allow for the construction of underground utilities, water features, deep garden beds etc. To facilitate construction works to proceed in accordance with ecologically sustainable development (ESD) principles and minimise waste materials resulting from the development, the following excavation management principles are required to be implemented:
  - Following the successful excavation and validation of all impacted materials assessed as requiring on-site containment any residual fill materials within the area to be excavated to accommodate future services etc, will be scraped and stockpiled;
  - The underlying natural soils will then be inspected by the environmental consultant in order to assess if the materials are consistent with the definition of VENM as defined by the *Protection of the Environmental Operations Act 1997* (POEO Act);
  - Should the soils be assessed as consistent with VENM, the materials will be preferentially excavated and recycled off-site for beneficial re-use; and
  - VENM materials will be over-excavated to form the containment cell (or appropriate alternative location) to accommodate the balance of fill materials that were excavated and stockpiled separately.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6. Validation Plan

The validation of remedial works will be conducted by the environmental consultant to demonstrate that the remediation objectives have been achieved in accordance with Section 8 of the RAP (JBS&G 2019a).

6.1 Validation Sampling and Analysis

6.1.1 Potential Impacted Fill Soils (AEC4)

The validation approach adopted for asbestos and other potential COPCs within fill materials will be dependent upon the type of impacts encountered on-site and the adopted remediation approach to manage the impacts. The validation approach will need to be approved by the site Auditor prior to implementation. However, it is noted that the validation procedure for on-site containment of materials is provided in **Section 6.1.4**.

6.1.2 Chlorinated Ethene Impacted Soils (AEC1)

Validation of Excavations

The inferred remedial excavation extent with respect to chlorinated ethene impacts is shown on **Figure 3**. However, the final extent will be informed by field screening of soil vapour levels within the excavations. The methodology will be undertaken with consideration to the guidance on vapour sampling methods outlined in CRCCARE (2013[4]), the requirements of the RAP (JBS&G 2019a) and data collected during remediation works to demonstrate the reliability of the method.

For sub-soil vapour sampling, the following methodology will be applied:

- Boreholes will be advanced via hand auger or drill rig at the nominated locations. 6 mm nylon tubing with a stainless steel tip will be installed to the depth of the borehole, which will then be backfilled with graded sand adjoining the base of the sample tube, overlain by a nominal thickness of powdered bentonite, and backfilled with grout/bentonite chips to create an air-tight seal at the surface.
- Soil vapour probes will be installed to a depth of 1 m within the walls or base of the excavation via driving a star picket with a metal tube attached (or similar device/probe as appropriate for sampling vapours) from within the excavation;
- A multi-gas meter will then be used to purge each probe for a period of at least 30 s. Gas readings will be monitored until oxygen and PID readings stabilise;
- Following this a leak detection evaluation will be completed via placement of an isopropyl alcohol-soaked rag over the top of the backfilled borehole to assess the potential occurrence of leaks whilst the gas detector is purging the sample point. Elevated PID readings on the gas detector will indicate a leaking probe. Any leaking probes will be required to be reinstalled and re-checked prior to sampling using the same method;
- Installed probes shall be left to equilibrate (30 minutes for spear point or similar probes and 24 hours for soil vapour wells, in accordance with NEPC (2013) requirements) and then soil-vapour samples extracted. Extracted soil vapour samples may be analysed in field via gas-chromatography (using FROG 4000 or similar) and determination of acceptability will be based on subsequent analysis of soil and soil-vapour samples.
- Should the results of field screening provide a preliminary indication of a lack of residual impacts – then carbon tube samples will be submitted for confirmatory laboratory analysis;

[4] *Field assessment of vapours*, CRC CARE Technical Report no. 13, CRC for Contamination Assessment and Remediation of the Environment, Adelaide, Australia.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Carbon tube samples will be collected via attaching a calibrated low-flow pump (<0.2 L/min) to the carbon tube using additional section of 6mm Teflon tubing as required;
- Withdraw sufficient soil gas over the carbon tube to ensure required detection limits are met for relevant COPCs and submit tubes for VOC 8260 analysis.

The final sampling density will be consistent with Section 8.2.6.1 of the RAP (JBS&G 2019a) and comprises:

- 1 soil vapour probe per 10 m of excavation wall, with a minimum of one per wall; and
- 1 soil vapour probe per 100 m^2 of excavation base, with a minimum of one per excavation.

In addition, soil samples will be collected from the walls of excavations formed by the removal of impacted soils at a frequency of one sampler per 5 m of excavation wall, with a minimum of one per wall and 1 per 25 m^2 from the base of the excavation, with a minimum of four samples.

Soil and soil-vapour validation will be analysed for concentrations of TRHs and VOCs. Soil samples will be reviewed to identify whether any soil-bound chlorinated ethenes are present at laboratory detection limits. If soil-bound CEs are present, leachate samples must be prepared and analysed for CE concentrations to determine assess the potential for leachate generation. Soil-vapour samples will be compared against site validation criteria (i.e. NEPM 2013 HIL-C, Section 8.7 of JBS&G (2020)) and soil leachate generation compared against groundwater validation criteria (i.e. ANZG (August 2018[5]).

Validation of Suitability for On-site Containment

Noting that the final location for the containment cell of CE impacted soils will be at least 30 m away from current/future structures that will preclude the potential for vapour intrusion – the only assessment required to validate suitability for on-site retention (of excavated and impacted CE soils) will comprise an assessment of leachability of the materials (and therefore on-going risks to groundwater). As such, one soil sample will be collected from each unique 70 m^3 stockpile and submitted for Australian Standard Leaching Procedure (ASLP) VOC analysis at a NATA registered laboratory. The validation criteria will be sourced from values provided to ANZG (August 2018) for fresh water ecosystems protective of 95% of species.

6.1.3 Soils Underlying Transformers (AEC3)

The validation approach adopted for soils underlying the transformer will be dependent upon the type of contamination encountered on-site and the adopted remediation approach to manage the impacts. The validation approach will need to be approved by the site Auditor prior to implementation.

6.1.4 Validation of Soil Containment

The area of the containment cell (for asbestos and/or CE impacted soils) will be required to be surveyed by a Registered Surveyor and will be subject to placement of a barrier layer (that comprises a GCL layer for CE impacted soils and a marker and capping layers for all impacted soils that are not covered in hardstand) to prevent unforeseen access to impacted soils. Therefore, the areas subject to on-site containment will require the following validation information as prepared by a Registered Surveyor:

- A location plan of the placed materials with co-ordinates based on an agreed grid system (e.g., GPS or relative to the lot boundaries);

[5] Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- The levels in m AHD of the base of the placement location(s) prior to the material placement;
- The levels in m AHD of the placement locations once all materials have been placed;
- Daily inspections by the environmental consultant to record when and where the GCL and marker layer has been installed;
- The levels in m AHD of the finished barrier layer surface; and
- Subsequently the total placed volume of materials.

The survey information shall be used to document the thickness of the barrier layer across the site. In addition, the survey is required to detail the lateral extent of the site area.

In addition, the environmental consultant will be required to visually inspect the installation of the GCL and marker layers and provide photographic evidence that it was appropriately installed for inclusion in the validation report.

A long term environmental plan (LTEMP, refer to **Section 6.3**) will be prepared documenting the presence of the impacted material and the management measures required to ensure the long term protection of human health and the environment. Appropriate notation on planning certificate and/or title will be made, documenting the presence of the LTEMP and impacted materials.

6.2 Validation Reporting

At the completion of the remedial works, a validation report will be prepared in general accordance with the *Guidelines for Consultants Reporting on Contaminated Sites* (OEH 2011), documenting the works as completed. The report will contain information including:

- Update relevant portions of the site description and CSM as prepared in this RWP to the condition of the validation assessment footprint at the time of the validation assessment;
- Present all sampling field notes and laboratory data including calibration certificates for field monitoring equipment, environmental monitoring etc.;
- Undertake an assessment of QA/QC of analytical data generated by the works and identify data that is reliable for use in characterising the site;
- Sort data into data sets as required by the decision rules;
- Assess whether sufficient data has been obtained to meet required limits on decision error;
- Undertake assessment to the decision rules;
- Provide a summary of waste disposal/off-site removal activities and volumes of material removed from the site including supply of all waste disposal dockets confirming final waste disposal/landfill destination;
- Provide a summary of material imported to site for remediation including material source, type, assessment of suitability, approximate quantities, date of importation and final placement location;
- Details of the remediation works conducted;
- Information demonstrating that the objectives of the RAP (JBS&G 2019a) and this RWP have been achieved, in particular the validation sample results and assessment of the data against both the pre-defined data quality objectives and the remediation acceptance (validation) criteria;
- Survey information as related to the site boundaries as well as areas subject to on-site containment etc (**Section 6.1.4**);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Information demonstrating compliance with appropriate regulations and guidelines;
- Document any variations to the strategy undertaken during the implementation of the remedial works;
- Details of any environmental incidents occurring during the course of the remedial works and the actions undertaken in response to these incidents;
- Other information as appropriate, including requirements (if any) for ongoing monitoring / management; and
- Provide a comment on the suitability of the site for the proposed use and requirements for any ongoing monitoring/management (where applicable).

The report will serve to document the remediation works for future reference.

6.3 Long Term Environmental Management Plan

At the conclusion of remediation/validation works, a LTEMP will be prepared according to the requirements outlined NSW EPA *Guidelines for the NSW Site Auditor Scheme (3rd edition)* (NSW EPA 2017) to detail the required measures to ensure the continued suitability of the site for its proposed use. The LTEMP shall contain the following elements (as appropriate) as based on the extent of data that will be available at the cessation and validation of remediation works:

- A statement of the objectives of the LTEMP – i.e. to ensure continued suitability of the site after it has been remediated;
- Identification of residual environmental contamination issues at the site that require ongoing management/monitoring to meet the LTEMP objectives, including the type of contamination and location within the site (including survey plans). This should further include characterisation of the material in-situ on the site as consistent with the extent of validation data proposed to be collected;
- Documentation of environmental management measures which have been implemented to address the identified environmental issues at the site;
- Description of management controls to limit the exposure of site users to known areas of contamination to acceptable levels;
- Description of responsibilities for implementing various elements of the provisions contained in the LTEMP;
- Timeframes for implementing the various control/monitoring elements outlined in the LTEMP;
- Environmental monitoring and reporting requirements (if required) for the future management of environmental impact underlying the site including:
    - Appropriate monitoring locations and depth within and down-gradient of any residual contamination;
    - Relevant assessment criteria to be used in evaluating monitoring results;
    - Frequency of monitoring and reporting;
    - Process for reviewing monitoring data and how decisions will be made regarding the ongoing management strategy;
    - The length of time for which monitoring is expected to continue;
    - The regulatory authorities involved and the management inputs required from each;

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- The integration of environmental management and monitoring measures for groundwater;

- Health and safety requirements for particular activities;
- A program of review and audits;
- The provisions in the LTEMP are feasible (i.e., able to be implemented) and able to be legally enforceable (i.e., a mechanism exists, such as development consent conditions, to give the plan a basis in law);
- The relevant consent authority is satisfied that the inclusion of a development consent condition relating to the implementation of the LTEMP is acceptable; and
- Corrective action procedures to be implemented where LTEMP assessment criteria are breached.

The LTEMP will be provided to the appointed site auditor for review and approval prior to preparation of the final site audit statement and accompanying site audit report for the site.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7. Conclusion

The RWP presented herein is a concise work plan describing the contaminated soil remediation/management requirements during site redevelopment. It is intended to present the required remedial works in an accessible form such that contractors can readily scope and conduct the required works. However, it should be read in conjunction with the existing RAP (JBS&G 2018a), which documents in detail required environmental monitoring and validation requirements. It is considered that if all the procedures are sufficiently followed in conjunction with the RAP, the site can be made suitable for the proposed development.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquiries.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

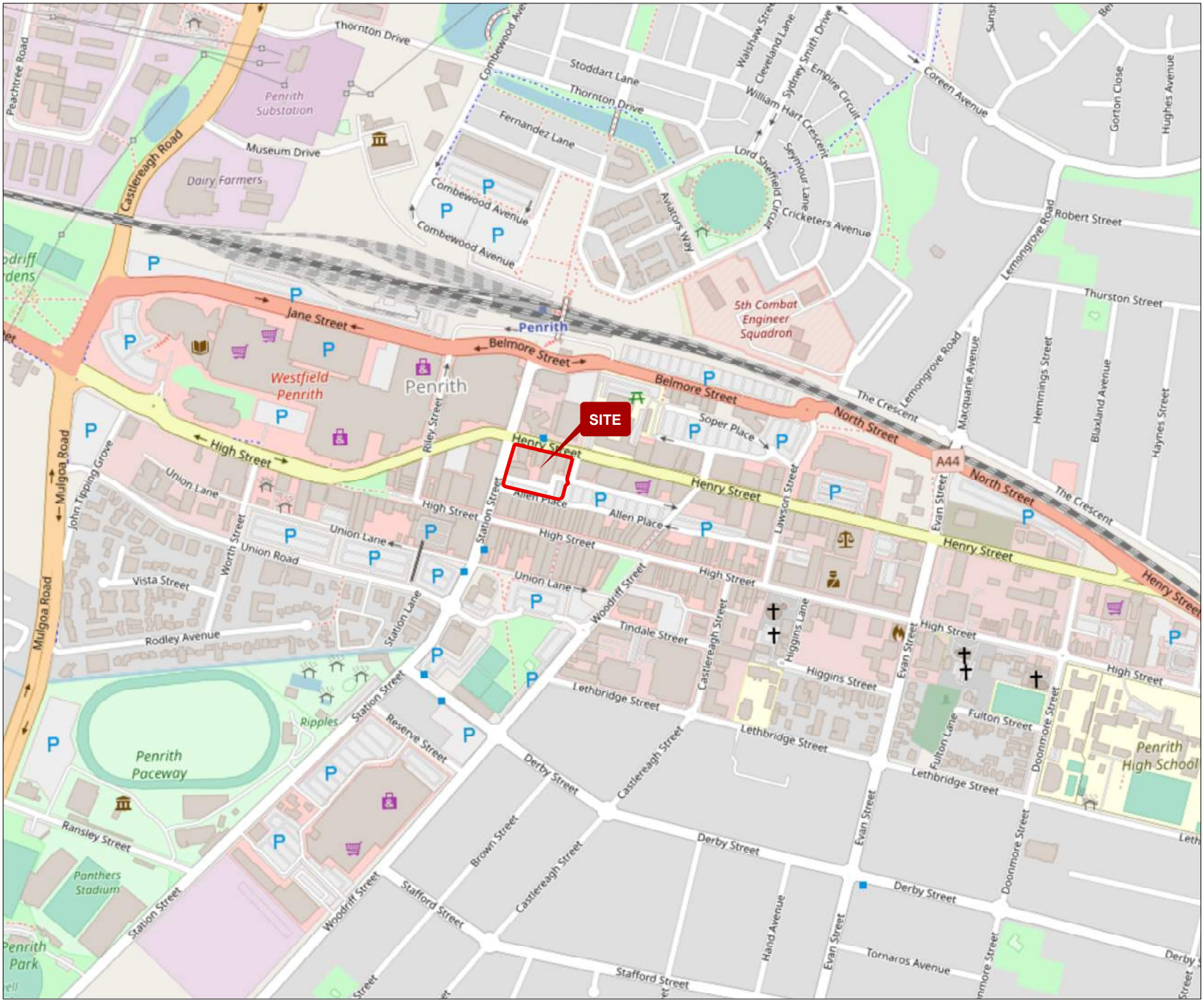
Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figures

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



Legend:

Approximate Site Boundary

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R04 Rev A	Date: 03-Dec-2020
Drawn By: RF/RH	Checked By: CB

Scale 1:8,500

0 100 200

metres

Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SITE LOCATION

FIGURE 1

Reference: © OpenStreetMap (and) contributors, CC-BY-SA

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Legend:

- Project Boundary of Previous Investigations
- Approximate Site Boundary
- Cadastre (NSW LPI, 2019)
- Site Features Polygon
- Sewerage Infrastructure / Preferential Pathway

Areas of Environmental Concern

- AEC 1- Dry Cleaners Location
- AEC 2 - Former Service Station Location
- AEC 4 - Transformer

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R05 Rev 0	Date: 03-Dec-2020
Drawn By: JA/RH	Checked By: CB

Scale 1:600

0 7.5 15

metres

Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SITE LAYOUT

FIGURE 2

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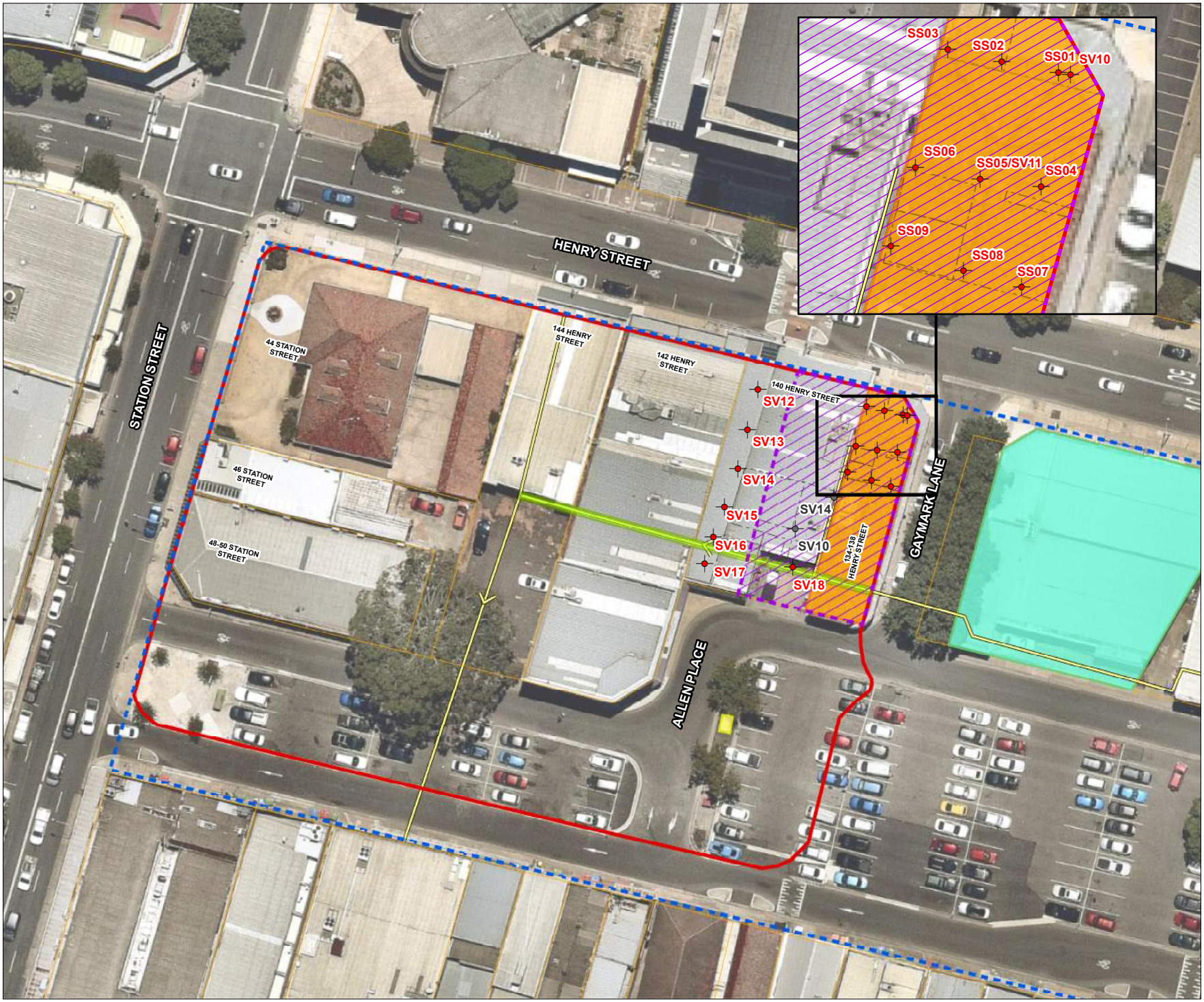

Legend:

- Approximate Site Boundary
- Cadastre (NSW LPI, 2019)

Type

- Inferred Remedial Extent
- Potential Remediation - Sewer Trench
- Project Boundary of Previous Investigations
- Sewerage Infrastructure / Preferential Pathway
- Site Features

Areas of Environmental Concern

- AEC 1- Dry Cleaners Location
- AEC 2- Former Service Station Location
- AEC 4 - Transformer
- Sample Location (JBS&G 2019)
- Sample Location (JBS&G 2020)

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R05 Rev 0	Date: 03-Dec-2020
Drawn By: JA	Checked By: CB

Scale 1:750

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

48-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SAMPLE LOCATIONS AND REMEDIAL EXTENT

FIGURE 3

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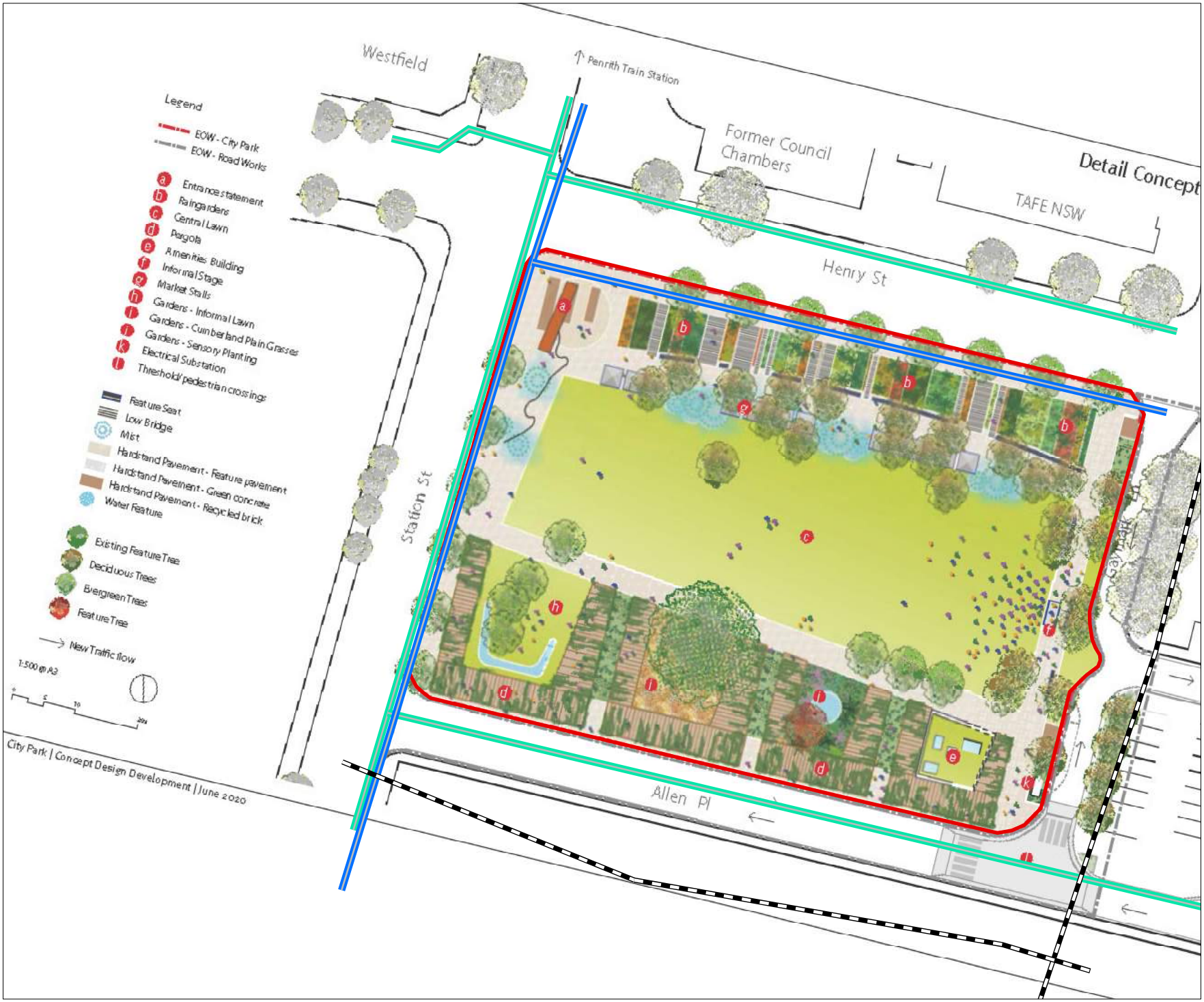

Legend:

Approximate Site Boundary

Proposed Utilities

Gas Main

Sewer

Water Main

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R05 Rev 0	Date: 04-Dec-2020
Drawn By: JA/RH	Checked By: CB

Scale 1:800

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

PROPOSED SITE LAYOUT AND UTILITIES

FIGURE 4

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Legend:

- Approximate Site Boundary

Proposed Utilities

- Gas Main
- Sewer
- Water Main

Suitable Area for Containment Cell

- >30m from Structures, >1m from Utilities

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R05 Rev 0	Date: 04-Dec-2020
Drawn By: JA/RH	Checked By: CB

Scale 1:800

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SUITABLE AREAS FOR CONTAINMENT CELL

FIGURE 5

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Version: 1, Version Date: 14/04/2021

Appendix A – Bentofix Product Specification

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Global Synthetics

TECHNICAL INFORMATION

Bentofix®

Geosynthetic Clay Liners for Landfills

From the inventors of needle punched thermally locked Geosynthetic Clay Liners and now polyethylene coated GCL with options for coating thickness and coating texture. The polyethylene is extrusion applied to form an intimate bond with the Bentofix® GCL substrate.

This innovative development reduces the risk of desiccation, cation exchange, gas emission and potential bentonite erosion loss issues of many competitor GCL that use glue applied, thin film sheet membranes that attempt to address these issues.

Bentofix® continues to develop technological advantages for your industry.

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Version: 1, Version Date: 14/04/2021

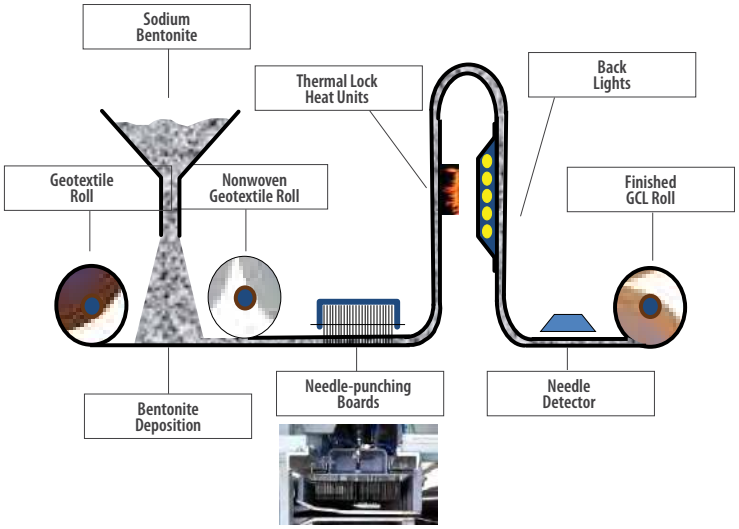
Historical Perspective of **Bentofix®** in Australia

Bentofix® GCL has been successfully installed throughout Australia for over a decade. Millions of square metres of Bentofix® product continues to effectively contain potentially hazardous wastes across Australia.

Bentofix® is a shear strength transmitting geosynthetic clay liner. The product consists of a high quality sodium bentonite powder encapsulated between an upper and lower layer of geotextile. The **Bentofix®** products are continuously needle punched through all components and then will be subject to some controlled heat treatment such that the fibres are effectively "thermally locked" in place to obtain high long term shear strength.

The Original Invention

Manufacturing Schematic – Needle-punched GCL



Innovation of the **Bentofix®** Product

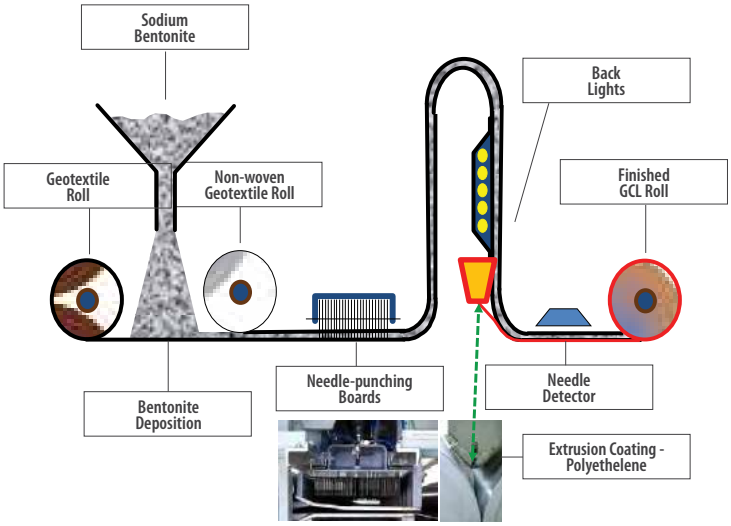
Recent product innovation has led to a unique coated product which combines all the proven benefits of the **Bentofix®** GCL with a speciality polyethylene extruded coating directly applied during the manufacturing process. These products are known as **Bentofix®** X2 NSP4900 and X5F NSP4900.

Polyethylene has a remarkable and proven history of high resistance to chemical attack from many leachates found in landfill applications.
Additional product features include a range of applied coating thicknesses ensuring extremely low hydraulic conductivities. A unique optional texturing pattern ensures high interface friction values that assist in overcoming potential instability issues of the GCL on steep slopes.

Additional benefits include the ability to reduce cover to landfill caps by overcoming desiccation issues, provide a positive gas barrier layer and extend the range of sealing applications in a wide range of soil types. Additional supporting information is available from Global Synthetics.

The Latest Innovation

Manufacturing Schematic – Needle-punched GCL with Additional Polyethylene Coating



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Bentofix® GCL Specification

Bentofix® Sodium Bentonite Properties

Bentofix® Geosynthetic Clay Liners contain a sodium bentonite powder that is processed to exceed all requirements of local Australian and International standards for bentonite quality. The use of a powdered sodium bentonite ensures positive hydration and hence compliant sealing properties.

PROPERTY	TEST METHOD	UNITS	VALUE
Bentonite Particle Size	Dry Screen[1]	% passing 75 microns	≥ 80
Swell Index	ASTM D5890[2]	mL/2g	≥ 24
Fluid Loss	ASTM D5891[3]	mL	≤ 18
Montmorillonite Content of Bulk Sample	XRD Quantitative Mineralogy Analysis[4]	% Bulk Sample	≥70
Montmorillonite Content of Bulk Sample - Methylene Blue	VDP69 (Methylene Blue)[5]	mg/g	≥ 300
Calcium Carbonate Content ($CaCO_3$)	XRD Quantitative Mineralogy Analysis[6]	% Bulk Sample	≤ 2
Polymer Additive	Manufacturers Statement Nil Polymer Additives[7]	Nil Additive	Manufacturers Statement Nil Polymer Additives
Cation Exchange Capacity	Methylene Blue	c mol/kg or meq/100g	≥ 70

Test Method Explanation

Note 1- Bentonite Particle Size

Particle size provides an indication of the reactive surfaces. Smaller particle sizes generally react more efficiently and effectively with water to result in better swelling, lower fluid loss, higher swelling pressure, greater gel strength and lower permeability.

Note 2- Swell Index

This is an index test that evaluates the swelling potential of the bentonite component of a GCL. The index relates to bulk swelling under minimal confinement. The swell index is generally inversely proportional to GCL permeability. Generally the higher the swell index the lower the GCL permeability.

Note 3- Fluid Loss

This is an index test that evaluates the fluid loss properties of the bentonite component of the GCL under standard conditions of pressure over specified intervals of time. A low fluid loss value is indicative of the ability of the bentonite to restrict movement of liquid under load. A low fluid loss value is related to GCL permeability. The lower the fluid loss value the lower the GCL permeability.

Notes 4 & 5- Montmorillonite Content

Both methods of either X Ray Diffraction (XRD) or by Methylene Blue titration quantify the mineralogy of the bentonite. The montmorillonite content can be expressed as a percentage of the bulk sample or as a size fractionated percentage such as less than 0.5 microns. Good agreement is obtained between chemical analysis of bentonite using method VDP69 and XRD methods of deriving montmorillonite content. The higher the montmorillonite content the better the performance of the GCL.

Note 6- Calcium Carbonate Content

Generally the calcium content must be kept to minimal levels as calcium montmorillonite has a much lower swelling potential than sodium montmorillonite. The presence of calcium can be determined by XRD methods and performed on a size fractionated percentage of the bentonite (≤ 0.5 micron fraction).

Note 7- Polymer Modified Bentonite Powder

The addition of chemical modification of the bentonite powder, with polymers, will generally give higher swell index values and lower fluid loss numbers. Both these test methods are short term tests with little documentation on the long term performance of these altered powders. Both local and International Specification documents for the use of GCL either do not allow their use or warn strongly against use unless the manufacturer can fully substantiate long term performance of the candidate GCL.

In all instances, the use of polymer modification must be fully disclosed by the manufacturer.

Bentofix® GCL Specification

Bentofix® GCL Properties & available grades

Grade NSP4900

Bentofix® NSP4900 is a shear strength transmitting geosynthetic clay liner, continuously needle punched through all components. The upper layer is a polypropylene non-woven geotextile and the carrier layer (bottom) is a polypropylene woven geotextile. Unique to this product, the fibres are "thermally locked" to ensure high long term shear strength. The use of high quality sodium bentonite powder ensures a low permeability containment product ideally suited to applications of landfill containment. Additional edge impregnation of bentonite powder is placed 500mm wide along both longitudinal edges of the roll in the cover layer. A 300mm edge overlap line is placed on the carrier side of the GCL.

Grade X2 NSP4900

X= Coated
2= Polyethylene 200 gsm Coating (0.2mm nominal thickness)

Bentofix® X2 NSP4900 is a shear strength transmitting geosynthetic clay liner, continuously needle punched through all components. The upper layer is a polypropylene non-woven geotextile and the carrier layer (bottom) is a polypropylene woven geotextile. Following on from the needling process a liquid polyethylene coating of 0.2mm thickness is applied to the entire surface of the woven side of the GCL. Polyethylene has excellent resistance to many leachates found in landfills. This coating is in direct and intimate contact with the GCL with excellent bond characteristics.

The use of high quality sodium bentonite powder ensures a low permeability containment product ideally suited to applications of landfill containment. Additional edge impregnation of bentonite powder is placed 500mm wide along both longitudinal edges of the roll in the cover layer. A 300mm edge overlap line is placed on the coated side of the GCL.

The innovative use of a composite GCL/polyethylene coating ensures extremely low permeabilities less than $1x\ 10^{-14}$ m/sec and meets the requirements of GRI specifications for coated GCL's.

Grade X5F NSP4900

X= Coated
5= Polyethylene 500gsm Coating (0.5mm nominal thickness)
F= textured frictional surface.

Bentofix® X5F NSP4900 is a shear strength transmitting geosynthetic clay liner, continuously needle punched through all components. The upper layer is a polypropylene non-woven geotextile and the carrier layer (bottom) is a polypropylene woven geotextile. Following on from the needling process a liquid polyethylene coating of 0.5mm thickness is applied to the entire surface of the woven side of the GCL. Polyethylene has excellent resistance to many leachates found in landfills. This coating is in direct and intimate contact with the GCL with excellent bond characteristics.

The use of high quality sodium bentonite powder ensures a low permeability containment product ideally suited to applications of landfill containment. Additional edge impregnation of bentonite powder is placed 500mm wide along both longitudinal edges of the roll in the cover layer. A 300mm edge overlap line is placed on the coated side of the GCL. The innovative use of a composite GCL/polymer coating ensures extremely low permeabilities less than $1 x\ 10^{-14}$ m/sec and meets the requirements of GRI specifications for coated GCL's.

Additionally a highly textured surface is provided to increase interface shear of this GCL.

Bentofix® GCL Typical Guide for Landfill Applications

Bentofix® Application	**Bentofix®** Grade		
	Bentofix® NSP4900	Bentofix® X2 NSP4900	Bentofix® X5F NSP4900
Base lining			
Flat or shallow slope	✔	O	O
Side slopes > 1V:2H	O	–	✔
Capping			
Flat or shallow slope	O	✔	O
Slopes > 1V:2H	O	–	✔
Liquid/leachate Containment	–	✔	O

✔ Suggested product grade – Further analysis required O Optional product grade

Product Selection Notes and Limitations

(1) Where there is the risk of Ion exchange from the subgrade, high salinity in the ground water, a harsh leachate, or potential for desiccation beneath a wrinkled geomembrane, possible bentonite erosion on slopes, or when the GCL is used in contact with geonet; then a coated GCL (Bentofix® X2 or X5F) is suggested for use to minimise these risks.

(2) Bentofix® coated GCLs may be used alone as a single liner for a landfill cap. The coating protects the GCL against possible desiccation, internal erosion, Ion exchange and root penetration, and provides an instant gas barrier.

(3) The cover soil thickness can be reduced by up to 50% when a Bentofix® coated GCL (X2 or X5F) is used as a single liner for a landfill cap.

(4) The slope angles indicated are typical only and should be verified with appropriate testing using specific site soils. Other influences may be the use of other complimentary geosynthetics such as HDPE liner and Geonets in

Bentofix® GCL			Recommended GRI or NAUE	EPA GRI GCL3	Bentofix® NSP4900	Bentofix® X2 NSP4900	Bentofix® X5F NSP4900
Material Property	Test Method	Units	Manufacturer's Testing Frequency	MARV	MARV	MARV	MARV
Bentofix® GCL COMPONENTS							
Cover Nonwoven Geotextile Mass	ASTM D5261	g/m²	1 sample per 20,000 m²	≥ 200	≥ 200	≥ 200	≥ 200
Cover Woven Geotextile Mass	ASTM D5261	g/m²	1 sample per 20,000 m²	≥ 100	≥ 100	≥ 100 *(+ Coating)*	≥ 100 *(+ Coating)*
Bentonite Mass @ 0%mc	ASTM D5993	g/m²	1 sample per 4,000 m²	≥ 3700	≥ 3700	≥ 3700	≥ 3700
GCL Mass @0% mc	ASTM D5993	g/m²	1 sample per 4,000 m²	≥ 4000	≥ 4000	≥ 4200	≥ 4500
Bentofix® COATING CHARACTERISTICS							
Polyethelene Coating	ASTM D5261 EN ISO 9864	g/m2	1 sample per 4,000 m²	≥ 100	n/a	≥ 200	≥ 500
Polyethelene Thickness	Microscope - Direct Measurement	mm	1 sample per 20,000 m²	n/a	n/a	≥0.2 *(typical)*	≥0.5 *(typical)*
Bentofix® GCL STRENGTH PROPERTIES							
Tensile Strength *(machine direction)*	ASTM D6768	kN/m	1 sample per 20,000 m²	≥ 4.0	≥ 10.8	≥ 10.8	≥ 10.8
Peel Strength	ASTM D6496	N/m	1 sample per 4,000 m²	≥ 360	≥ 360	≥ 360	≥ 360
CBR Strength	EN ISO 12236 / ASTM 6241	N	1 sample per 20,000 m²	n/a	≥ 1800	≥ 1800	≥ 1800
Bentofix® PERMEABILITY/ HYDRAULIC PROPERTIES (MaxARV Values [1])							
Permeability / Hydraulic *(GCL only)*	ASTM D5887	m/s	1 sample per 25,000 m²	$\leq 5x10^{-11}$	$\leq 2.5x10^{-11}$	$\leq 2.5x10^{-11}$	$\leq 2.5x10^{-11}$
Permeability @ 35 kPa Permeability @ 500 kPa	ASTM D6766 ASTM D6766 *(mod)*	m/s m/s	1 test per year	1×10^{-8} 5×10^{-10}	1×10^{-8} 5×10^{-10}	n/a	n/a
Permeability / Hydraulic *(Coated GCL)*	ASTM D5887	m/s	1 sample per formulation	n/a	n/a	$\leq 1 \times 10^{-14}$	$\leq 1 \times 10^{-14}$
Index Flux (Q^{10}) GCL Only	ASTM D5887	$(m^3/m^2)/s$	1 sample per 25,000 m²	$\leq 1 \times 10^{-8}$	$\leq 9 \times 10^{-9}$	$\leq 9 \times 10^{-9}$	$\leq 9 \times 10^{-9}$
Bentofix® COMPONENT DURABILITY							
Geotextile and Reinforcing Yarns	See GRI GCL3 Sect 5.6.2	% Strength Retained	1 test per year	≥ 65	≥ 65	≥ 65	≥ 65
Polyethylene Coating	See GRI GCL3 Sect 5.6.4	% Strength Retained	1 test per year	≥ 85	n/a	≥85	≥ 85
Bentofix® GCL EDGE IMPREGNATION							
Edge Width Treatment	Direct Measurement	mm	Each Roll Treated	n/a	500	500	500
Bentofix® GCL EDGE OVERLAP MARKING							
Overlap Mark	Direct Measurement	mm	Each Roll Marked	300	300	300	300
Bentofix® ROLL DIMENSIONS (typical standard-other roll lengths available to suit specific projects)							
Roll Width	Direct Measurement	m	Each Roll Measured	-	5	4.85	4.85
Roll Length	Direct Measurement	m	Each Roll Measured	-	40	40	35
Roll Mass	Direct Measurement	kg	Each Roll Measured	-	980	1020	930
Bentofix® GCL SPREADER AND STINGER BAR AVAILABLE					YES	YES	YES

1 MaxARV = Maximum Average Roll Value - a MaxARV value is defined as the Mean or Typical values plus 2 standard deviations.
2 MARV = Minimum Average Roll Value – a MARV is defined as the Mean or Typical values less 2 standard deviations.

Our commitment to Quality

NAUE does not chemically modify the sodium bentonite that is used in any of our **Bentofix®** GCL's ensuring the owner, operator and landfill designer of secure containment for the life of the landfill.

Bentofix® GCL s are rigorously tested from raw material supply right through the production process to the finished product.
Bentofix® GCLs are produced under certified ISO9001 Quality processes. All in-house laboratories are fully accredited by National Testing Associations to ensure that test standards are maintained at the highest levels. State of the art test equipment is used to ensure repeatable quality product is produced and that our specification values are achieved. We use the highest quality bentonite and do not chemically alter our bentonites with polymers to achieve our stated specifications and those recognised by statutory regulators around the world.

The following extracts clearly state the precautions of using polymer modification of the bentonite powder in GCLs for landfill containment applications. All precautions are from current best practice guidelines;

EPA VICTORIA

Best Practice Environmental Management (BPEM) Publication 788.2, 2014 – page 93: Appendix E2.1.1.2 – Bentonite Form;

"… other additives, such as polymers or pH modifiers, may be added to improve the swelling and sealing capability of sodium-activated bentonites. However, the nature and suitability of these additives is difficult to check. If used, the manufacturer should provide their details and demonstrate their nature, suitability and long-term durability"

THE GEOSYNTHETIC RESEARCH INSTITUTE (GRI) - USA

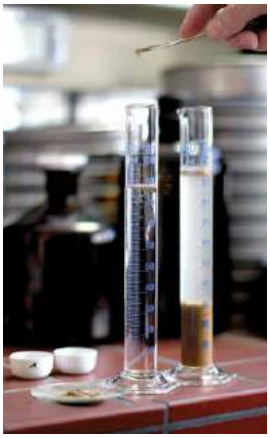
GRI-GCL5, 2013 – page 23: Clause 11.7 - Design Considerations for Geosynthetic Clay Liners (GCLs) in Various Applications;

"… It should be noted that there is presently (2011) several ongoing research efforts in modifying both sodium and calcium bentonites, primarily (but not exclusively) with polymer additives. The goals of these efforts are to reduce cation exchange. Of course, the long-term performance of these polymers needs to be addressed, as well as the environmental impact. If polymers are added they should be noted in the product data sheets."

ENVIRONMENT AGENCY (EA) - UK

EA Publication: Using Geosynthetic Clay Liners in Landfill Engineering, ver.3 – page 5: Clause 2.4

"… Some GCL manufacturers use additives to enhance certain characteristics such as initial swell and leachate resistance in reinforced GCLs, or in the form of glues in unreinforced liners. The nature and suitability of these additives is difficult to ascertain. As a result we would prefer they were not used unless the manufacturer is able to demonstrate their nature, suitability, and long term durability. Manufacturers must provide details of all additives used in the manufacture of their GCLs. Where the additive is a polymer, you must ascertain the manufacturer has not used excess polymer during the manufacture of the GCL. Excess polymer can cause excessive swelling of the clay/polymer filling in needle punched GCLs pushing the geotextiles apart, and allowing bentonite migration and subsequently loss of integrity."



Bentofix® a name to be trusted for quality

Global Synthetics

Australian Company Global Expertise

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Document Status

Rev No.	Author	Reviewer	Approved for Issue		
		Name	Name	Signature	Date
A	Chris Bielby	Matthew Bennett	For Review	For Review	17 September 2020
B	Chris Bielby	Matthew Bennett	For Review	For Review	8 December 2020

Document Set ID: 9547379
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Appendix B Remedial Action Plan

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Penrith City Council
Penrith Central Park Village
Overarching Remedial Action Plan

114 to 146 Henry Street,
42 to 50 Station Street,
And Allen Place Car Park

5 March 2019

55073/120362 Rev 0

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Version: 1, Version Date: 14/04/2021

Penrith City Council
Penrith Central Park Village
Overarching Remedial Action Plan

114 to 146 Henry Street,
42 to 50 Station Street,
And Allen Place Car Park

5 March 2019

55073/120362 Rev 0

JBS&G Australia Pty Ltd

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table of Contents

Abbreviations vii

1. Introduction 1
   - 1.1 Introduction and Background 1
   - 1.2 Objective 2
2. Proposed Development Concept 3
   - 2.1 Background 3
   - 2.2 Building Development Area 3
   - 2.3 Penrith City Park 3
3. Site Condition and Surrounding Environment 4
   - 3.1 Site Identification 4
   - 3.2 Site Description 4
     - 3.2.1 The Dry Cleaner, 134-138 Henry Street, Penrith 5
     - 3.2.2 Shop 3, 140 Henry Street, Penrith 5
   - 3.3 Surrounding Land Use 5
   - 3.4 Topography 6
   - 3.5 Geology and Soils 6
   - 3.6 Salinity 6
   - 3.7 Hydrology 7
   - 3.8 Hydrogeology 7
   - 3.9 Acid Sulfate Soils 7
   - 3.10 Meteorology 8
4. Summary of Site History 9
5. Previous Investigations 10
   - 5.1 Preliminary Environmental Site Assessment Report, Geo-Logix (2016) 10
   - 5.2 Phase 2 Environmental Site Assessment, JBS&G (2017) 10
     - 5.2.1 Introduction 10
     - 5.2.2 Results of the Assessment 11
   - 5.3 Shop 3 Gaymark Lane, Penrith, NSW – Human Health Risk Assessment, JBS&G (2017b) 12
   - 5.4 Data Gap Investigation – Penrith Central Village Park (JBS&G 2018a) 12
6. Conceptual Site Model 14
   - 6.1 Overview 14
   - 6.2 Potentially and Contaminated Media 14
     - 6.2.1 AEC 1 Former Dry Cleaner 15
     - 6.2.2 AEC 2 Former Service Station 17
     - 6.2.3 Additional Issues 18

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.3 Potential for Migration 19
6.4 Potential Exposure Pathways 20
6.4.1 Recreational Public Open Spaces 20
6.4.2 Building Development Areas 20
6.4.3 Offsite Exposure 20
6.5 Receptors 21
6.6 Preferential Pathways 21
6.7 Data Gaps 21
7. Remedial Action Plan 23
7.1 Remedial Goal 23
7.2 Extent of Remediation 23
7.3 Assessment of Remedial Options 23
7.4 Proposed Remedial Approach 30
7.5 Regulatory and Planning Requirements 30
7.6 Remedial Scope of Works 32
7.6.1 Site Establishment 32
7.6.2 Demolition of Overlying Buildings and Current Hardstands 32
7.6.3 Refine Remedial Extents 33
7.6.4 Excavation of Impacted Soils 34
7.6.5 Treatment of Chlorinated and Petroleum Hydrocarbon Impacted Soils 35
7.6.6 Physical Separation 35
7.6.7 Importation and Off-site Disposal of Fill Materials 36
7.6.8 Asbestos Management 36
7.6.9 Movement of Material 37
8. Validation Plan 41
8.1 Overview 41
8.2 State the Problem 41
8.2.1 Identify the Decision 41
8.2.2 Identify Inputs to the Decision? 41
8.2.3 Define the Study Boundaries 42
8.2.4 Develop a Decision Rule 42
8.2.5 Specify Limits of Decision Error 44
8.2.6 Optimise the Design for Obtaining Data 47
8.3 Soil Sampling Methodology 55
8.3.1 Soil Sample Containers 55
8.3.2 PID Screening 55
8.4 Groundwater Sampling Methodology 55

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.5 Soil-vapour Assessment 56
8.5.1 Temporary Soil Vapour Probe and Soil Vapour Well Installation 56
8.5.2 Soil-vapour Sampling 56
8.6 Laboratory Analysis 57
8.7 Validation Criteria....60
8.7.1 Application of Soil Assessment Criteria 66
8.7.2 Material Characterisation for Off-site Disposal 67
8.7.3 Imported Materials 67
8.7.4 Validation of Soil Placement Areas 67
8.8 Reporting....68
8.9 Environmental Management Plan....68
9. Contingency Plan 70
9.1 Unexpected Finds....70
9.1.1 Change in Development Plans 70
9.1.2 Identification of Additional Underground Storage Tank 71
9.1.3 Identification of Oily or Tarry Materials....71
9.1.4 Identification of Chlorinated Hydrocarbon Impact....71
9.1.5 Material Storage Breach 71
9.1.6 Emissions Complaints....71
10. Other Remediation Documents....73
10.1 Remedial Works Plans 73
10.2 Environmental Management 73
10.2.1 Preparation of a Remediation Environmental Management Plan 73
10.2.2 Required Elements/Procedures 73
10.2.3 Certification....75
10.2.4 Hours of Site Operation/Duration of Works 75
10.3 Health and Safety 75
10.3.1 Work Health and Safety Management Plan 75
10.3.2 Additional Site-Specific Elements/Procedures....76
10.3.3 Asbestos 76
10.3.4 Additional Consideration of Chemical Contaminants....76
11. Conclusions and Recommendations....78
11.1 Conclusions....78
11.2 Recommendations 78
12. Limitations 79

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

List of Tables

Table 3.1 Summary Site Details 4
Table 7.1: Remediation Options Assessment Matrix 25
Table 8.1: Summary of Quality Assurance / Quality Control Program 46
Table 8.2 Validation Sample Analytical Frequencies 52
Table 8.3: Soil Laboratory Analysis Methods (all units in mg/kg) 57
Table 8.4: Groundwater Laboratory Analysis Methods (all units in mg/L) 59
Table 8.5: Soil-vapour Laboratory Analysis Methods (all units stated in mg assuming sample volume of >25 L) 59
Table 8.6 Health Based Soil Investigation Criteria and Hydrocarbon Management Limits (all units in mg/kg) 61
Table 8.7 Ecological Investigation and Ecological Screening Levels (all units in mg/kg) 63
Table 8.8 Soil-vapour Health Investigation and Screening Levels (all units in mg/m^3) 64
Figure 9.1 - Unexpected Finds Protocol 72
Table 10.1 Required Elements of the REMP 74

List of Figures

Figure 1 Site Location
Figure 2 Proposed Development Layout
Figure 3 Site Layout and Areas of Environmental Concern
Figure 4A Historical Soil Sample Locations and Tier 1 Exceedances
Figure 4B Groundwater Well Locations, Tier 1 Exceedances and Inferred Groundwater Flow Direction
Figure 4C Soil Vapour Sample Locations and Tier 1 Exceedances
Figure 4D 134-138 and 140 Henry Street Floor Plan and Vapour Sample Locations
Figure 5 Depth of Fill/Fill Thickness
Figure 6 Remedial Extent

Appendices

Appendix A Design Plans
Appendix B EPA Searches
Appendix C Borehole Logs and Monitoring Well Installation Details
Appendix D Materials Tracking

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Abbreviations

Term	Definition
ACM	Asbestos Containing Material
AHD	Australian Height Datum
ASS	Acid Sulfate Soils
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CEC	Cation Exchange Capacity
COPC	Contaminants of Potential Concern
Council	Penrith City Council
CSM	Conceptual Site Model
DA	Development application
DGI	Data Gap Investigation
DO	Dissolved Oxygen
DP	Deposited Plan
DPI	Department of Primary Industry
DQI	Data Quality Indicator
DQO	Data Quality Objective
EC	Electrical Conductivity
Eh	Redox Potential
EIL	Ecological Investigation Levels
Envirolab	Envirolab Services Pty Ltd
EPA	NSW Environmental Protection Authority
ESA	Environmental Site Assessment
ESL	Ecological Screening Levels
Eurofins	Eurofins MGT
GME	Groundwater Monitoring Event
GPS	Global Positioning Unit
ha	Hectare
HIL	Health Investigation Levels
HSL	Health Screening Levels
JBS&G	JBS&G Australia Pty Ltd
LOR	Limit of Reporting
NATA	National Association of Testing Authorities
OEH	Office of Environment and Heritage
PAH	Polycyclic Aromatic Hydrocarbons
PARCCS	Precision, Accuracy, Representativeness, Comparability, Completeness and Sensitivity
PCB	Polychlorinated Biphenyls
pH	Potential of Hydrogen
PID	Photo-ionisation Detector
ppm	Parts Per Million
QA/QC	Quality Assurance / Quality Control
RAP	Remedial Action Plan
RL	Relative Level
RPD	Relative Percent Difference
SWL	Standing Water Level
RWPs	Remedial Works Plan
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
UPSS	Underground Petroleum Storage System
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
VVSAQP	Vapour Validation Sampling Analytical and Quality Plan

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1. Introduction

1.1 Introduction and Background

JBS&G Australia Pty Ltd (JBS&G) has been engaged by Penrith City Council (Penrith, the client) to provide environmental consultancy services associated with the proposed redevelopment of the Penrith City Village Park (PCPV, the site) (**Figure 1**). The site comprises ten (10) legal properties over an approximate area of 1.87 hectares (ha) bound by Station Street, Henry Street, Allen Place and Woodriff Street North, as shown on **Figure 1** and **Figure 2**. The address and legal identification of each property are provided in **Table 3.1**.

The site is currently zoned 'Commercial Core (B3)' and 'Public Recreation (RE1)' (Penrith 2010[1]) and is proposed to be developed for mixed uses including recreational areas and 4 to 6 storey residential apartments with ground floor retail/commercial uses and potential multi-level basements. As part of the rezoning process for the site council requires (in accordance with SEPP55) that it is demonstrated that the site is suitable (or can be made suitable) for the proposed land use.

To facilitate feasibility planning and costing, Council has engaged JBS&G to provide an overarching Remedial Action Plan (RAP), as documented herein. Upon development of detailed design plans, and establishment of project staging, detailed Remedial Works Plans (RWPs) can be prepared to facilitate staged remediation of the site. This RAP is for remediation of the PCPV site redevelopment. Should contamination present in offsite areas require remediation this will be subject to separate RAPs/RWPs.

The site has historically been used for a combination of residential and commercial land uses, including dry-cleaning and retail fuel dispensing, followed more recently by light commercial land uses (retail shops, restaurants, health/wellness services, tutoring services and a funeral parlour). Contamination investigations conducted at the site (Geo-Logix 2016[2], JBS&G 2017[3], JBS&G 2019a[4] and JBS&G (2019b[5]) have identified the presence of elevated volatile organic compounds (VOC) within site media surrounding the former dry-cleaner.

The RAP identifies strategies and remedial options to address the identified environmental impact and render the site suitable for the proposed land use. This RAP has been prepared with reference to relevant Australian Standards and guidelines made or approved by the NSW EPA.

1 *Penrith Local Environmental Plan 2010.* Penrith City Council, Published 11 March 2016, Penrith 2010

2 *Preliminary Environmental Site Assessment Report. 134 – 138 Henry Street Penrith NSW 2750'*, Geo-Logix Pty Ltd, Reference: 1601069Rpt01FinalV01_12Aug16, 12 August 2016, Geo-Logix (2016)

3 *Phase 2 Environmental Site Assessment – 114 to 146 Henry Street, 42 to 50 Station Street and Allen Place Car Park, Penrith, NSW.* JBS&G Australia Pty Ltd, Reference 52372/113034, 9 July 2017, JBS&G (2017);

4 *Data Gap Investigation – 114 to 146 Henry Street, 42 to 50 Station Street and Allen Place Car Park.* JBS&G Australia Pty Ltd, Reference 52372/113024, 15 January 2019, JBS&G (2019a);

5 *Basement Vapour Intrusion Assessment* – 121 Henry Street, Penrith, NSW. JBS&G Australia Pty Ltd dated 15 January 2019, Reference 55702-119862, JBS&G (2019b)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1.2 Objective

The objectives of this RAP are to:

- Provide a summary of historical site assessments and present a conceptual site model (CSM) documenting the known extent of environmental impact at the site and key exposure pathways associated with the proposed development;
- Identify outstanding potential contamination issues which require further assessment prior to the development and implementation of detailed site-specific RWPs;
- Identify the remedial strategy(ies) to be adopted by an assessment of remedial options considering the proposed land use; and
- Document the procedures and standards to be followed in order to remove the risks posed by contaminated soils, soil vapour and groundwater to make the site suitable for the proposed development, while ensuring the protection of human health and the surrounding environment.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2. Proposed Development Concept

2.1 Background

Council has indicated that the site is to be redeveloped into a mixture of public open spaces, and six storey structures comprising a mixture of retail, restaurant, services, entertainment and cultural spaces. The PCPV area is intended to be highly accessible and includes internal shared paths/roads and pedestrian laneways. Preliminary conceptual plans (**Appendix A**) show the current and proposed land uses, the layout of new green spaces, development sites, laneways and pedestrian arcades.

The PCPV provides a range of open spaces including parks and facilities offering places for relaxation, recreation and opportunities for community interaction. The conceptual site layout is shown on **Figure 2**. Council envisages that the western site portion is to be redeveloped into a contemporary public space which creates a focal point for the City Centre and fosters social and economic growth. The balance of the site will comprise development sites to be utilised for residential apartments, laneways, minor green spaces and pedestrian arcades.

2.2 Building Development Area

Preliminary design plans (**Appendix A**) include a mixture of recreational use and 4 to 6 storey residential apartments within the building development area, occupying approximately 11 200 m^2 of the site (**Figure 2**). It is anticipated that bulk excavation to form basements may be required within this portion of the site. The basement is anticipated to occupy a footprint between 13 000 m^2 and 19 000 m^2 and comprise two basement levels. Future landscaped areas (paved extents and/or establishment of flora) within this portion of the site will likely be limited to shallow plantings within constructed garden beds. Laneways and shared paths within the building development area are anticipated to comprise a mixture of concrete, asphaltic and paved hardstands.

2.3 Penrith City Park

Review of the design plans indicate that the Penrith City Park component of the site will comprise a large (approximately 7500 m^2) open recreational space. The park is envisaged to comprise a mixture of paved and grassed areas including shallow/deep planted gardens and potentially raised garden boxes.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3. Site Condition and Surrounding Environment

3.1 Site Identification

The site location is shown on **Figure 1**. The extent of the site and associated cadastral boundaries are shown on **Figure 2**. The site details are summarised in **Table 3.1** and described in detail in the following sections.

Table 3.1 Summary Site Details

Property Identification and Street Addresses	The site is comprised of the following legal properties: • Lot 1 in DP 545587 – 114 to 116 Henry Street • Lot 1 in DP113118 – 118 to 120 Henry Street • Lot 1 in DP 254763 – Henry Street • Lot 1 in DP 164798 – 134 to 138 Henry Street • Lot 10 and 11 in DP 553665 – 142 Henry Street • Lot 2 in DP 556075 – 144 Henry Street • Lot 3 in DP1200790 – 42 to 44 Station Street • Lot 1 in DP 526304 – 48 to 50 Station Street • Lot E in DP 163176 – 46 Station Street In addition, the site area includes the Allen Place Car Park, Gaymark Lane and Allen Place.
Local Government Authority	Penrith City Council
Approximate MGA Coordinates (MGA 56)	As shown on **Figure 2**
Site Zoning	Commercial Core (B3) and Public Recreation (RE1), Penrith (2010)
Current Use	Commercial (car parking, retail, restaurant and services)
Previous Use	Commercial/industrial (car parking, dry cleaning, petroleum dispensing and general retail/services) and residential
Proposed Use	High density residential, public open space and commercial
Site Area	Approximately 1.87 ha

3.2 Site Description

The site was inspected by Rohan Hammond on 3 May 2018.

The site is an irregularly shaped, large commercial precinct bound by the Allen Place loop, Henry Street, Station Street and 98-100 Henry Street. The site area includes the Allen Place car park and ten commercial premises on the southern side of Henry Street in Penrith. The borders of the site were not secured and open to the public (pedestrians and vehicles). The site was utilised for a range of commercial operations at the time of the site investigation including a car park, retail shops and cafes. High pedestrian and vehicular traffic was observed during working hours. All commercial premises at the site were noted to be occupied.

The site generally sloped downward from east to west, with a slight ridge line observed to dissect the centre of the car park. Inspection of site surfaces and comparisons with the surrounding landscape indicated that significant topographical alterations had not occurred.

Approximately 95 % of the ground surfaces were sealed as asphaltic pavement, concrete pathways, and building footprints with onsite drainage channels directing surface water toward the municipal stormwater system. The balance of the site comprised unsealed grounds in the form of garden beds.

Buildings at the site did not exhibit significant indicators of dilapidation, although minor wear, consistent with the age of the buildings was observed. A detailed inspection/hazardous building materials survey of the existing site structures was not undertaken as part of this investigation.

No surface water was present at the site at the time of the investigation. No evidence of waste storage, except for commercial municipal waste bins, or storage tanks were observed at the site. No

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

olfactory indicators of volatile chemical usage, as described in the DSI, were encountered during the recent site inspection. No visual indicators of gross or widespread contamination were observed.

Four transformers were observed: one in the southwest and east corners of the site and two along the northern boundary of the Allen Place Car Park, which were on raised concrete platforms. No hydrocarbon staining was observed to be associated with the transformers. The location of the transformers is shown on **Figure 2.**

3.2.1 The Dry Cleaner, 134-138 Henry Street, Penrith

The former dry cleaner comprised the northern third of the building located at 134-138 Henry Street, Penrith. The shop-front occupied most of the building footprint (>85 %), with the remainder comprising a secluded water closet, storage space and point of sale. The premise was an operational scooter store, occupied by scooters, bikes, helmets and related paraphernalia.

The water closet comprised a small (<3 m^2), fully enclosed space which was serviced by two separate sewerage disposal points. Detergents, household solvents and soaps were observed to be stored within the water closet. The shop-front was serviced by an air exchange (air-conditioning) unit which was observed to be operational during each visit to the premises.

In the alleyway between The Dry Cleaner and Shop 3, numerous services were present. Sewerage infrastructure and stormwater pipes ran in a north to south orientation, connecting stormwater and sewerage pipes to the greater system, south of the premises. Services were noted to comprise a mixture of terracotta and polyvinyl chloride (PVC) pipes.

3.2.2 Shop 3, 140 Henry Street, Penrith

Shop 3 comprised the southern half of the building located at 140 Henry Street, Penrith. The shop was partitioned into four rooms and a water closet, joined by a central hallway. The premises housed an alternative health centre at the time of the investigation.

The shop-front rooms were serviced by air exchange units (air conditioners) which were observed to be in operation during each site visit. The water closet comprised a small (<5 m^2), fully enclosed space which was serviced by two separate sewerage disposal points.

An inspection of the property revealed the presence of household cleaning and medical products: limescale solvents, surface cleaners, stain removers, methylated spirits, polishes, pest control products, ethanol based surface wipes and carpet deodorizers.

3.3 Surrounding Land Use

The current land uses of adjacent properties or properties across adjacent roads are summarised below.

- North – The site is bound to the north by Henry Street and then numerous commercial premises including UFC Gym, Queens of Hearts Community Foundation and Nepean College. Further north is an open carpark and commercial premises on Belmore Street, including Bob Jane T-Marts and Veterinary Hospital;
- East – To the east of the site is Woodriff Street North, followed by commercial premises and Edwards Place carpark. Further east a Pathology Centre and testing laboratory are present;
- South – The is was bound to the south by Allen Place, following which are multiple commercial properties including cafes, a medical centre and pharmacy. Beyond High Street commercial premises are present; and
- West – The site is bound to the west by Station Street, then medium to high density commercial premises. Further to the west is Peach Tree Creek and eventually the Nepean River.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.4 Topography

Review of topographic information obtained from the Spatial Information Exchange Viewer, LPI (2015[6]) regional topographic map indicated that the site surfaces have an elevation of approximately 30 m Australian Height Datum (AHD). The site generally slopes downwards to the west, towards the Nepean River.

Site inspection confirmed that the topography on site was not significantly altered from the natural alignment and sloped slightly downward toward the western boundary, Station Street. A local ridge line existed which dissected the Allen Place Car Park in an approximately west to east alignment, with site surfaces sloping downwards perpendicular to the ridge line.

3.5 Geology and Soils

Reference to the 1:100 000 Geological Series Sheet for Penrith, DMR (1991[7]) indicates that the site is underlain by Bringelly Shale of the Wianamatta Group originating from the Middle Triassic epoch. This unit is comprised of shale, carbonaceous claystone, claystone, laminite, fine to medium-grained lithic sandstone, rare coal and tuff. Bringelly Shale is underlain by Ashfield Shale and, at depth, Hawkesbury Sandstone.

Reference to the 1:100 000 Soil Landscape Series Sheet for Penrith, DMR (1990[8]) indicates that the site is within the Richmond Soil Landscape group. This group of landscape is characterised by quaternary terraces of the Nepean and Georges Rivers. Relatively flat (slopes <1 %) and level. Splays, levees provide local relief of <3 m. Formerly a low open woodland. Richmond soils are poorly structured orange to red clay loams, clays and sands. Texture may increase with depth. Ironstone nodules may be present. Plastic clays in drainage lines, red earths and red podzolic soils occur on terrace surfaces with earthy sands on terrace edges. Limitations of the Richmond group include high erosion hazard on terrace edges and minor localised flooding.

The lithology observed during previous investigations (PSM 2017[9], JBS&G 2017and 2018) is as follows:

- Shallow to moderately deep alluvial soils comprising clay to sandy clay (present from a depth of 0.4 m to 10.5 m below ground surface (bgs));
- Moderately deep to deep alluvial clay to sandy clay mixed with Nepean River gravels (present from a depth of 6.1 m to 13.0 m bgs); then
- Residual shale bedrock (present from a depth of 13.0 m to 15.0 m bgs).

3.6 Salinity

Reference to the Department of Infrastructure, Planning and Natural Resources salinity potential map GS912, DIPNR (2002[10]), has indicated that the site exists within an area of 'moderate salinity potential'.

Vegetation at the site during the site inspection did not exhibit any indicators of salinity related stress.

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6 *'Spatial Information Exchange Viewer'*, NSW Land and Property Information, Accessed 4 January 2018, https://maps.six.nsw.gov.au/;
7 '*Penrith 1:100 000 Geological Series Sheet 9030 (Edition 1)'*. Department of Mineral Resources, 1991, DMR (1991);
8 *'Penrith 1:100 000 Soil Landscape Series Sheet 9030'*. Department of Mineral resources, 1990, DMR (1990);
9 *'Central Park Village, Penrith Geotechnical Investigation*'. Pells Sullivan Meynink, 2017, PSM (2017);
10 *'Salinity Potential In Western Sydney 2002 – GS912'*. Department of Infrastructure, Planning and Natural Resources, March 2003, DIPNR (2002);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.7 Hydrology

Rainfall is considered likely to migrate primarily through surface water runoff into the municipal stormwater system. Minor infiltration into the underlying porous soils and surface is also expected in areas of unsealed ground.

As discussed in **Section 3.2**, the site is largely covered by concrete, asphaltic pavements and building footprints. As such, surface water generated during periods of rainfall is anticipated to primarily enter the municipal stormwater system; via discharge into onsite stormwater catchment infrastructure or alternatively discharge into stormwater pits within the surrounding roadways.

The nearest water body to the Site is Peach Tree Creek, approximately 1.1 km to the west of the site boundary. Peach Tree Creek ultimately contributes to the Nepean River. Municipal stormwater discharges to the Nepean River.

3.8 Hydrogeology

Registered groundwater bore information was obtained from the NSW Department of Primary Industries groundwater mapping tools, NSW DPI (2016[11]). A review of the registered bore information indicated that there were thirteen bores within a 1.5 km radius of the Site. Based on the reported geology, topography and depth to groundwater, groundwater migration is expected to occur in a north-westerly direction, towards Peach Tree Creek approximately 1.2 km away. Groundwater has been reported in the surrounding properties within the river gravels layer. The DGI (JBS&G 2019a) reported groundwater depths ranging from 6.96 m to 8.05 m bgs, flowing in a north-westerly direction.

Registered groundwater bores located within a 1.5 km radius of the site are used for monitoring, recreational and testing purposes. Given the relatively dense urban use of the site and surrounding properties, in addition to the identified licensed bores, there is a moderate probability of additional undocumented bores near the site. No reported utilisation of groundwater as a drinking water source has been reported.

3.9 Acid Sulfate Soils

The Guidelines for the Use of Acid Sulfate Soil Risk Maps, Department of Land and Water Conservation (DLWC) (1997[12]), has indicated that acid sulfate soils (ASS) are likely to be located in coastal lowlands up to about 10 m AHD. No risk map for the area encompassing the site was provided as part of the acid sulfate soil risk map series, DLWC (1998). Review of the geographical and topographical location of the site has indicated that it is a significant distance away from tidal creeks or estuaries, and it is considered unlikely that ASS would exist at the site.

Three Section 149(2&5) planning certificates were obtained for the site, provided in the DSI (JBS&G 2017a). The land was not identified to have been affected by a policy adopted by Council or adopted by any other public authority, notified to Council, that restricts the development of the land because of the likelihood of ASS.

No staining, odours or other indicators of ASS were observed during the DSI or DGI (JBS&G 2017 and 2019a).

[11] NSW Department of Primary Industries, 2015. Groundwater Monitoring Overview Map. Http://allwaterdata.water.nsw.gov.au/water.stm. Accessed 8 November 2016;

[12] '*Guidelines for the use of Acid Sulfate Soil Risk Maps, Edition 2*', 1998, Ref: ISBN 0 7347 5134 6, NSW DLWC (1998);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.10 Meteorology

A review of average climatic data for the nearest Bureau of Meteorology monitoring location (Penrith Lakes[13]) indicates the site is located within the following meteorological setting:

- Average minimum temperatures vary from 5.5 ^{o}C in July to 18.5 ^{o}C in January;
- Average maximum temperatures vary from 17.7 ^{o}C in July to 30.7 ^{o}C in January;
- The average annual rainfall is approximately 728.1 mm with rainfall greater than 1 mm occurring on an average of 71.7 days per year; and
- Monthly rainfall varies from 30.6 mm in September to 121.4 mm in June with the wettest periods occurring on average in January to June.

[13] http://www.bom.gov.au/climate/averages/tables/cw_067113.shtml, Commonwealth of Australia, 2013 Bureau of Meteorology, Product IDCJCM0028 prepared on 1 November 2016 and accessed by JBS&G on 8 November 2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4. Summary of Site History

The historical contamination assessments undertaken at the site (Geo-Logix 2016, JBS&G 2017 and 2018) presented a site history review based on the following information sources:

- Section 149(2&5) certificates obtained from council from three representative lots;
- Current and historical land title records;
- Records of stored Dangerous Goods held by WorkCover;
- Historical aerial photographs obtained from the Department of Lands;
- Publicly available heritage records held by the Department of Planning and Environment and Council, where readily available;
- Council Development Application / Building Application (DA/BA) records; and
- Records of environmental incidents, former environmental licences, or contaminated land notices or notifications, available from the EPA.

The site has been used for a range of residential and commercial purposes throughout the period to which records are available. Section 149 (2&5) certificates, historical land title records and aerial photographs indicate that the site comprised primarily low density residential premises from 1881 to 1949, following which it was progressively redeveloped into a commercial precinct.

The commercial precinct included mostly low-risk activities such as restaurants, retail and other services. Two premises were identified to have previously been used for activities with elevated potential to cause contamination of the land:

- Shop 3/134-138 Henry Street, Penrith – dry cleaning services (1977 – 2016); and
- 118-120 Henry Street, Penrith – garage proprietary services (1967 – 1973).

Historical assessments (Geo-Logix 2016, JBS&G 2017 and 2018) have identified contamination within the vicinity of the former dry cleaner (Shop 3/134-138 Henry Street). Following identification of contamination underlying and within the vicinity of the premises, Council notified the NSW EPA of contamination present at Shop 3/134-138 Henry Street.

Subsequently the EPA provided a response to Council (EPA 2018[14]) which made the determination that regulation of the chlorinated hydrocarbon impacts present at Shop 3/134-138 Henry Street under the *Contaminated Land Management Act 1997* was not currently required.

No items of aboriginal or European heritage were identified at the site.

[14] *Former Dry Cleaners – 134-138 Henry Street, Penrith*. NSW Environment Protection Authority Reference DOC17/523668-04

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5. Previous Investigations

The following provides a summary of the information and site characterisation data presented within key assessment reports. These reports include both historical and information relating to investigations conducted at that time.

Comments in relation to contaminants of potential concern (COPC) are provided in the following text in relation to assessment criteria adopted at the time of report preparation.

Sample locations completed during JBS&G (2017 and 2019a) are shown on **Figure 4A** to **4D**. Exceedances of assessment criteria specific to the sample location and to the future proposed land-use of the area are also shown on **Figure 4A** to **4D**. Historical sample results are compared against assessment criteria within **Table A(1), Table A(2), Table B, Table C** and **Table D.**

5.1 Preliminary Environmental Site Assessment Report, Geo-Logix (2016)

Council engaged Geo-Logix Pty Ltd (Geo-Logix) to conduct a preliminary ESA, Geo-Logix (2016) at the property located at 134-138 Henry Street, Penrith, NSW (the preliminary assessment area, Lot 1 DP164798, **Figure 2**). The preliminary assessment was undertaken to assess the potential for contamination to exist at the site given the presence of Shop 3/134-138 Henry Street within the preliminary assessment area.

The preliminary ESA indicated that the site appeared to be vacant until the 1950s. In the period intervening construction of the current building layout and its former vacant use, the site was used for storage of materials. The building layout as observed in the current investigation was constructed during the 1960s and the dry cleaner operated from 1977. Additionally, aerial photographs provided as part of the report indicated that a service station operated from the 1950s to the 1970s (The Service Station, Lot 1 DP113118, **Figure 2**) which was considered to potentially comprise an off-site contamination source for the preliminary assessment area (134-138 Henry Street). It is noted that the historical service station area forms part of the PCPV.

Geo-Logix carried out passive soil vapour assessments at two locations within the dry-cleaning shop. Chlorinated ethenes (CEs) PCE, TCE and DCE were detected in soil vapour samples at concentrations in exceedance of the commercial land-use criteria adopted for the assessment. Additionally, benzene, toluene, ethylbenzene and xylene (BTEX) compounds were detected within the soil vapour at concentrations above the laboratory limit of reporting (LOR) but below the commercial land use criteria. Geo-Logix did not identify onsite migration of contaminants from the former service station as a likely source for these BTEX compounds. The preliminary ESA report identified the presence of potential asbestos containing materials (ACM) forming part of the construction of building within the assessment area.

The site was notified to the EPA by Council following the works undertaken by Geo-Logix in accordance with the *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* (EPA 2015[15]).

5.2 Phase 2 Environmental Site Assessment, JBS&G (2017)

5.2.1 Introduction

JBS&G was engaged by Council to undertake a DSI at the site. The objective of the DSI was to determine potential for contamination based on current and historical site activities and to draw conclusions regarding the potential contamination status of the site for the proposed land-uses, or make recommendations to enable such conclusions to be made. Consideration was given to the

[15] *'Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*'. NSW Environment Protection Authority, September 2015, EPA 2015;

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

potential for contamination to represent unacceptable risks to future site users based on future land uses proposed under the Central Park Village redevelopment.

The assessment comprised a review of Geo-Logix (2016), the site's environmental setting and historical site activities in conjunction with a field investigation. The field program included inspection, sampling and analysis of soil samples from 28 borehole locations, 3 groundwater samples from monitoring wells installed as part of the program and 10 soil vapour samples collected from sub-slab soil vapour probes. The sampling locations undertaken as part of the DSI, including exceedances of the relevant criteria are shown on **Figure 4A** to **4C**. JBS&G indicated that the presence of buildings and occupied tenancies during the investigation precluded detailed assessment of all site areas.

The site history assessment indicated that the site has been used for a combination of residential and commercial purposes over the period of available records. Historical land title records, obtained for three of the legal properties, indicated that the premises were owned for residential purposes, prior to light commercial use (retail, service station and funeral home facilities). The site was identified to have undergone numerous redevelopments comprising demolition of former structures. Geo-Logics (2016) was reviewed as part of the site history investigation, which indicated the former dry-cleaning operation was a potential source of contamination.

The desktop assessment identified a range of COPCs associated with the following AECs:

- The dry cleaner (Shop 3/134-138 Henry Street, **Figure 3**): improper disposal of dry cleaning chemicals resultant from the operation of the dry cleaner;
- The Service Station (118-120 Henry Street, **Figure 3**): improper management of petroleum hydrocarbons associated with the operation of the former service station;
- Whole of Site: impacts to potential imported fill materials and disturbed/reworked natural materials:
  - Fill materials of unknown origins observed to be present due to site development activities;
  - Pesticide and herbicide application associated with onsite residential maintenance activities within surficial-moderately deep fill and natural soils;
  - Fuel and oil spills associated with onsite residential maintenance activities; and
  - Hazardous building materials associated with existing and former site structures.

5.2.2 Results of the Assessment

Bore and groundwater installation logs are presented in **Appendix C**. The logs indicate that underlying hardstand pavements, fill materials were encountered to depths ranging from 0.2 m and 2.0 m bgs. Fill comprised a combination of silts and clays with varying sand content. Colours were observed to be primarily brown and grey with some orange/yellow clays also encountered. Anthropogenic inclusions were observed within fill material from some locations. Three distinct natural materials were encountered during the investigation: silty/sandy clay which exhibited increasing (although still minor <10 %) sand content with depth (0.2 m – 10.5 m bgs), Nepean River gravels (6.1 m – 13.0 m bgs) and shale bedrock (>11.7 m bgs). No ACM, odours or staining were observed on site surfaces or within the soil profile at any investigation location. No PID readings >1 ppm were reported during field screening for volatile organic compounds during soil sampling.

Sample results from the soil vapour sampling and analyses indicated that CE impacts are present within the vicinity of the dry cleaner. Volatile gas impact extends north of the dry cleaner, along the inferred groundwater flow direction, with exceedances of the soil vapour criteria for PCE and TCE identified from gas samples taken at probe locations SV05 and SV10 (**Figure 4C**). It is noted that the most significant concentrations were detected at location SV05, approximately in line with the

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

inferred groundwater flow direction, and that no exceedances of the site investigation criteria were reported east or south of the dry cleaner.

Contaminants in soils and groundwater were generally not present at concentrations statistically significant and exceeding the site assessment criteria, with the exception of the following:

- Concentrations of PCE (0.059 mg/L) and toluene (0.094 mg/L) in groundwater, collected from location PSM01, were present at concentrations exceeding the adopted drinking water criteria, which was considered to represent a potential unacceptable risk to future onsite receptors.

In addition to the above, exceedances of the laboratory LOR for TRHs were reported in groundwater samples from PSM01, PSM02 and PSM03, the source for which was unclear. The concentrations were not considered representative of a risk to future onsite/offsite receptors.

Groundwater and soil concentrations within the vicinity of the dry cleaner also indicated the presence of CEs, primarily PCE and TCE, albeit at concentrations which were below the adopted site assessment criteria. With respect to the position of the dry cleaner, the inferred groundwater flow direction and the sewer diagrams provided in **Appendix E**, the presence of elevated PCE and TCE within the groundwater sample from PSM01 indicates that CEs may have migrated along the sewerage infrastructure prior to their release into the environment.

5.3 Shop 3 Gaymark Lane, Penrith, NSW – Human Health Risk Assessment, JBS&G (2017b)

JBS&G was engaged by Council to provide an assessment of the potential human health risk to future commercial occupants of the building described as Shop 3 Gaymark Lane, as located in the southern portion of Shop 3/140 Henry Street.

The Human Health Risk Assessment (HHRA) was considered warranted based upon a review of environmental data provided in JBS&G (2017), to determine whether soil, groundwater and/or soil vapour impact reported in JBS&G (2017) posed an unacceptable risk to a proposed future use of the premises for commercial purposes. This has been interpreted as consisting of occupation of the building for commercial activity/durations by adults to assess the risk posed to future occupants of the premises.

The risk assessment considered maximum levels of TCE and PCE recorded in soil vapour in proximity to the premises, and the levels reported adjoining the premises. A sensitivity analysis was undertaken with the risk assessment which found that the estimated levels of risk were considered suitably conservative to premise decision making in relation to objectives stated.

The levels of sub-surface impact were reported to not pose an unacceptable health risk to potential future commercial users of the site. JBS&G stated that there was no potential for aesthetic impacts through recognition of odours associated with the site impact.

5.4 Data Gap Investigation – Penrith Central Village Park (JBS&G 2018a)

JBS&G was engaged to complete a data gap investigation (DGI, JBS&G 2018a) following identification of contamination potentially associated with the former dry cleaner. The DGI comprised targeted soil, groundwater, soil-vapour and indoor air sampling. The DGI reviewed historical DA/BA records for the former dry cleaner and service station. Additionally, sewer service diagrams for the dry cleaner were presented within the report (**Appendix E**).

JBS&G advanced six boreholes within the vicinity of the former dry cleaner (JBMW01 to JBMW05 and SV19). Three boreholes were advanced adjacent to the northern boundary of the site (JBMW02, JBMW05 and SV19), two advanced approximately 50 m west of the dry cleaner and one northeast of the dry cleaner, downgradient of the former service station. Additionally, two boreholes (JBMW06 and JBMW07) were advanced into the property locatd at 48 Belmore Street, approximately 100 m north of the dry cleaner. Selected soil samples were submitted for the following laboratory analysis:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- 8 samples for VOCs;
- 3 samples for PAHs;
- 3 samples for lead;
- 2 samples for fraction organic carbon (Foc); and
- 1 sample for heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn).

Encountered lithological conditions were generally consistent with those reported in JBS&G (2017). Shallow fill was encountered ranging from 0 to 1.2 m bgs, overlying silty and sandy mottled clays (0.4 to 8.9 m bgs), in turn overlying gravelly sandy clay (6.5 m to 12.1 m bgs). Residual shale bedrock was encountered at 11.5 m to 12.1 m bgs at locations JBMW01 to JBMW04.

Seven of the boreholes were converted to groundwater monitoring wells, which were later developed and sampled in addition to previously installed wells (PSM01, PSM02 and PSM03). The groundwater well installation logs are provided as **Appendix D**. Groundwater was sampled over two mobilisations with wells JBMW02 and PSM01 sampled twice. Groundwater samples were analysed for a range of COPCs (VOCs, TRHs and heavy metals).

JBS&G installed 7 sub-slab soil vapour probes surrounding Shop 3/134-138 Henry Street and following sewerage service infrastructure (**Figure 4C**). The sub-slab soil vapour probes were used to access shallow soil vapour. In addition, two boreholes (JBMW05 and SV19) were converted to deep soil vapour wells on the northern side of Henry Street. Soil vapour was sampled via extraction of soil vapours and sorption of VOCs to laboratory prepared carbon tubes. All seven samples were analysed for VOCs.

JBS&G conducted four rounds of indoor air monitoring at 134-138 and 140 Henry Street. Indoor air was sampled at several locations within the shops over 8-hour periods using summa canisters. The indoor air samples were analysed for VOCs. Atmospheric conditions were reported to vary over the sample periods which targeted hot and pressure drop conditions.

Laboratory analytical results are discussed as follows:

- No statistically significant exceedances of the site investigation criteria were reported for COPCs in soils;
- Groundwater concentrations were less than relevant environmental guidance values, with the exception of PCE in JBMW02 (0.15 mg/L) which exceeded the adopted ANZECC (2000[16]) 95 % protection and NHRMC (2017[17]) drinking water criteria;
- CEs were detected in SV11, SV14 and SV16, but were less than the adopted site assessment criteria, with the exception of SV14. PCE (42 mg/m^3) and TCE (2.88 mg/m^3) exceeded the adopted site assessment criteria (HIL-C, NEPM 2013) at location SV14. It is additionally noted that TCE was detected in SV14 at a concentration of 0.168 mg/m^3, exceeding HIL-B and HIL-D criteria.
- Indoor concentrations were generally less than the adopted screening criteria, with the exception of location 140_SHOP (9 April 2018). The concentration of TCE (20 µg/m^3) reported at location 140_SHOP on 9 April 2018 exceeded the adopted indoor air screening criteria.

[16] *Australian and New Zealand Guidelines for Fresh and Marine Water Quality Volume 1.* National Water Quality Management Strategy, Australian and New Zealand Environment and Conservation Council, October 2000, ANZECC (2000);

[17] *National Water Quality management Strategy – Australian Drinking Water Guidelines 6 2011.* National Health and Medical research Council, October 2017, NHMRC (2011);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6. Conceptual Site Model

6.1 Overview

NEPC (2013) identifies a CSM as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The development of a CSM is an essential part of all site assessments.

NEPC (2013) identified the essential elements of a CSM as including:

- Known and potential sources of contamination and contaminants of concern including the mechanism(s) of contamination;
- Potentially affected media (soil, sediment, groundwater, vapours etc.);
- Human and ecological receptors;
- Potential and complete exposure pathways; and
- Any potential preferential pathways for vapour migration (if potential for vapours identified).

6.2 Potentially and Contaminated Media

Areas of environmental concern are shown on **Figure 3**. Potential and known contaminated media comprise:

- Fill materials;
- Underlying natural soils;
- Subsurface vapour and ground gases; and
- Groundwater

Table 6.1 Areas of Environmental Concern and associated Contaminants of Potential Concern

Areas of Environmental Concern (AEC)	Contamination Status	Potentially Contaminated Media	Contaminants of Potential Concern (COPC)
AEC 1 – Former Dry Cleaner 134-138 Henry Street (Lot 1 DP164798) Improper disposal/management of dry-cleaning chemicals	Known	Soil, groundwater, soil-vapour and indoor air	Chlorinated Ethenes (PCE, TCE, DCE)
AEC 2 – Former Service Station 118 Henry Street (Lot 1 DP113118) Potential UPSS and improper management of petroleum hydrocarbons	Potential	Soils	TRHs, PAHs, BTEX and lead
AEC 3 – Transformers Historical spillage/leakage of transformer oils underlying transformers within the Allen Place carpark.	Potential	Soils	TRHs and PCBs
AEC 4 – Fill material Underlying Buildings Fill materials of unknown origin used for site levelling and activities associated with development. Application of COPCs as a result of general maintenance during site occupation (pesticides, herbicides, fuel and oil spills etc).	Potential	soils	Heavy metals, PAHs, TRH, BTEX, OCPs, PCBs, VOCs and asbestos

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.2.1 AEC 1 Former Dry Cleaner

Soil, soil vapour and groundwater samples obtained during the DSI (JBS&G 2017a) and DGI (JBS&G 2019a) indicate that the greatest levels of chlorinated ethene impact is in the immediate vicinity 134-138 Henry Street and extending north and west of the premises. Detections of contaminant concentrations a considerable distance west of the premises provide evidence that the compounds may have migrated along the inferred sewerage infrastructure alignment. Impacts to site media are detailed in **Section 6.2.1.1** to **Section 6.2.1.4**

6.2.1.1 Soil Impacts

Soil samples analysed as part of the previous (JBS&G 2017a) and DGI (JBS&G 2019a) have not identified gross and/or widespread soil contamination. No soil samples analysed within the groundwater table, or nearby to sewerage infrastructure were reported to contain COPCs above the laboratory limit of reporting. Minor concentrations of PCE and TCE at location JHA04, underlying Shop 3/140 Henry Street, were reported in JBS&G (2017a).

Notwithstanding, it is considered likely that soils surrounding the sewerage infrastructure, and underlying the dry cleaner, have historically been impacted by dry cleaning solvents. The maximum levels of TCE reported in sub slab vapour are consistent with a source of chlorinated ethene being present in the unsaturated zone. Chlorinated ethenes can commonly be heterogeneously distributed through a soil profile, and localised within the extent of a sample of soil collected in clay based soils. Due to their characteristics subsurface chlorinated ethene impacted soils are not typically readily identified. Impacted soils are considered to potentially represent an ongoing source of contamination to both groundwater and soil vapour.

6.2.1.2 Groundwater Impacts

Groundwater analytical results indicated that PCE was present at concentrations exceeding the investigation criterion at JBMW02 and JBMW05, and above the laboratory limit of reporting in JBMW03, PSM01 and PSM03. Chlorinated ethenes were not detected in samples of groundwater collected from JBMW01, JBMW04, JBMW06, JBMW07 or PSM02. Trace concentrations of TCE in groundwater were reported at locations JBMW02 (0.002 mg/L to 0.009 mg/L), JBMW05 (0.002 mg/L) and PSM01 (0.001 mg/L).

It is noted that JBMW02 and JBMW05 are over the northern boundary of the site, providing evidence that the impact has migrated off the site via the groundwater. No groundwater monitoring wells have been installed directly into the chlorinated ethene impact source zone, although it is considered likely that the highest concentrations of chlorinated ethenes will be present directly underneath the dry cleaner.

Impacts to groundwater have been delineated north (JBMW06 and JBMW07), east (JBMW03), south (PSM02) and west (JBMW01 and JBMW04). Potential remains for groundwater impact to be present further northwest of JBMW05.

6.2.1.3 Soil vapour Impacts

Shallow Soil Vapour

Results obtained from the DGI (JBS&G 2019a) have shown that significant concentrations of PCE and TCE are present within shallow soil vapour (<0.3 m bgl) surrounding the dry cleaner. Soil vapour contaminant samples collected from locations SV11, SV14 and SV16 were reported to have concentrations of CEs above the laboratory limit of reporting. The highest results reported during the current assessment were associated with location SV14, which was placed immediately overlying sewerage infrastructure servicing the dry cleaner. Soil vapour samples collected from locations SV12, SV13, SV15 and SV17 were not reported to have any VOCs above the laboratory limit of reporting.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Within samples where both TCE and PCE were detected above the laboratory LOR, the ratio of PCE/TCE ranged from 4.143 to 14.49.

The distribution of CEs in soil vapour has provided evidence that the compounds have migrated within/alongside the sewerage infrastructure a considerable distance from the dry cleaner (>50 m). In addition, impacted soil vapour may be migrating over the northern boundary of the site, as indicated by elevated concentrations in SV11.

The investigation results indicate that the occurrence of CEs in shallow soil-vapour is not strongly correlated with presence in groundwater. Whilst volatilisation of CEs from groundwater is likely to be occurring, it is considered unlikely that it is occurring at a level which represents a risk to future site users on the basis of the following considerations.

- SV09 contained no soil vapour concentrations above the laboratory LOR with elevated underlying groundwater impact (PSM01, 0.033 mg/L to 0.059 mg/L);
- The largest groundwater impact (JBMW02) was near two soil-vapour sample locations which were reported to contain minimal concentrations (SV11) to no detection (SV12) of CEs in soil-vapour were present;
- SV16 contained elevated concentrations of CEs with no underlying groundwater impact (JBMW04), and the highest reported soil vapour impact is overlying adjacent to the sewerage infrastructure (SV14); and
- Groundwater is in excess of 7 m below the current ground surface.

Deep Soil Vapour

Two deep soil vapour samples were taken north of the former dry cleaner (SV18 and SV19). Samples were collected from 4.7 m to 5.0 m below ground levels. Highly elevated CEs were detected in both samples, exceeding interim HILs:

- SV18: PCE (367 mg/m^3) and TCE 1.62 (mg/m^3); and
- SV19: PCE (1300 mg/m^3) and TCE 8.83 (mg/m^3).

These results are indicative of the presence of contamination at beneath/adjacent to the former dry cleaners at depth. The relatively low concentrations in groundwater indicate that the deep source is unlikely to be present in the saturated zone. Additional assessment will be required to determine the extent of remediation required to address the presence of elevated CE in deep offsite soil vapour.

6.2.1.4 Indoor Air

Indoor air was sampled over four monitoring events (9 and 17 April 2018, 3 May 2018 and 15 November 2018). Samples analysed from Shop 3/134-138 Henry Street and Shop 3/140 Henry Street have indicated that the PCE is present within the indoor air of both premises. TCE was generally not detected above the laboratory limit of reporting in the analysed samples, with the notable exception of 140_SHOP on 9 April and 3 May 2018. **Table 6.2** and **Table 6.3** show ratios of indoor air to sub-slab vapour concentrations, and relative PCE to TCE concentrations within samples.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 6.2 Indoor Air and Sub-Slab VOC Concentrations

Sample Location	Highest Indoor Air Concentration (µg/m³)	Closest Sub-Slab Soil Vapour Concentration (µg/m³)	Indoor Air to Sub-slab Soil Vapour Ratio
Tetrachloroethene			
140_BATH	<3	14 500 (SV10)	<0.00021
140_SHOP	5	14 500 (SV10)	0.00035
DC_BATH	8	40 000 (SV14)	0.00020
DC_SHOP	8	40 000 (SV14)	0.00020
Trichloroethene			
140_BATH	<2.7	3500 (SV10)	<0.00077
140_SHOP	20	3500 (SV10)	0.00571
DC_BATH	<2.7	2760 (SV14)	<0.00098
DC_SHOP	<2.7	2760 (SV14)	<0.00098

Table 6.3 PCE to TCE Ratio in Site Media

Sample Location	Highest PCE Concentration (µg/m³)	Highest TCE Concentration (µg/m³)	Ratio of PCE/TCE	Approximate Distance From Shop 3/140 Henry Street / Distance From Shop 3/134-138 Henry Street (m)
Indoor Air				
140_BATH	<3	<2.7	-	Internal
140_SHOP	5	20	0.250	Internal
DC_BATH	8	<2.7	>2.963	Internal
DC_SHOP	8	<2.7	>2.963	Internal
Sub-Slab				
SV05	56 667	9333	6.072	<5 / 20
SV10	14 500	3500	4.143	Underlying / 15
SV14	40 000	2760	14.49	Boundary / < 5
SV16	1520	168	9.047	30 / 40

One reported concentration of TCE within indoor air sample 140_SHOP, 9 April 2018 (20 µg/m³), was inconsistent with the subsequent three samples taken at the same location, 17 April 2018 (<2.7 µg/m3),3 May 2018 (5 µg/m³) and 15 November 2018 (<2.7 µg/m³).

The ratio between TCE and PCE in this indoor sample was significantly different to all sub-slab soil vapour samples in which both TCE and PCE were detected. On this basis, the elevated concentration is considered likely to be the result of an additional, internal source within the premises, and is not considered to be reflective of CE advection from the sub-slab soil vapour.

6.2.2 AEC 2 Former Service Station

Environmental samples analysed as part of the site investigations (JBS&G 2017 and 2018) have provided evidence that gross and/or widespread contamination as a result of the former service station operation has not occurred.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Soil samples analysed from JBMW03, JHA04 and JHA06 were reported to have concentrations of TRHs below the adopted site investigation criteria. Soil vapour samples analysed from four locations surrounding the premises were reported to have concentrations of TRHs and BTEX compounds below the laboratory LOR or the site investigation criteria. No TRHs, PAHs or lead in groundwater above the laboratory LOR were reported at JBMW03. If any impacts to soil, groundwater or soil vapour have occurred as a result of the operation of the former service station, it is considered likely that they will be limited to minor, localised hotspots.

6.2.3 Additional Issues

Additional known and potential contamination issues identified are detailed in **Section 6.2.3.1** to **Section 6.2.3.3**.

6.2.3.1 Soil Characterisation

A total of 34 boreholes have been drilled across the site, on a generally systematic grid basis. The boreholes have been skewed as a result of the presence of site structures and to target AECs. Boreholes have provided adequate site coverage to inform site fill characterisation across the majority of the site. Notwithstanding, additional assessment/investigation of soils should be undertaken following removal of buildings to confirm that soil characteristics are consistent with those encountered across the balance of the site.

Fill materials have been reported/encountered across the entire site ranging from 0.15 m to 1.9 m depth. On average, the depth of fill is approximately 0.5 m (**Figure 6**). Fill was generally deeper underlying the commercial properties at the site, and shallower throughout the Allen Place car park. A deeper pocket of fill was identified at JB18 and JB19 terminating at 1.8 m and 1.9 m bgs respectively.

Fill materials are considered to be present due to a combination of historical land use activity and soil importation to establish levels/back fill services. Fill materials were generally identified to comprise a combination of silts and clays with varying sand content. Colours were observed to be primarily brown and grey with some orange/yellow clays also encountered. Anthropogenic inclusions were observed within fill material from some locations.

As presented in the characterisation summary tables (**Table A(1), Table A(2), Table B, Table C** and **Table D**) and **Figure 4A B**, fill materials have been shown to sporadically contain heavy metals (lead, nickel and zinc), TRH/TPH, PAHs, carcinogenic benzo(a)pyrene TEQ equivalent, CEs and asbestos to varying degrees. Statistical analysis of the contaminant data sets for soils, presented in JBS&G (2018), indicate that there are no statistically significant exceedances of the site suitability criteria (**Section 8**).

Identification of asbestos in soils was limited to a single occurrence of asbestos fines in shallow soils at location JB11. The concentration of asbestos was less than the site suitability criteria. It is noted, given the occurrence of anthropogenic inclusions within the fill soil profile, and the historical nature of the site, potential remains for additional asbestos impact within the fill.

Based on data presented in JBS&G (2017 and 2018), contaminant impacts in fill material appear to be associated with identifiable physical characteristics (such as the presence of slag, odours or staining), or underlying discrete point sources (JHA04, former dry cleaner).

With the exception of the above, and impacts discussed in **Section 6.1.1**, soils at the site are considered to be generally free from contamination. No odours, staining or asbestos were observed in any of the historical or current investigation locations. It is noted that the character of soils underlying existing building footprints, and underlying the four onsite transformers, has not yet been determined. Additionally, given the limitation of soil investigations via boreholes, there is the potential for asbestos impacts to be present within fill that have not yet been identified.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.2.3.2 Groundwater Characterisation

JBS&G (2017 and 2018) assessed groundwater conditions within eight wells, six on site (PSM01 to PSM03 and JBMW01, JBMW03, JBMW04), two adjacent to the northern boundary (JBMW02 and JBMW05) and two on 48 Belmore Street (JBMW06 and JBMW07) over three GMEs. Concentrations of COPCs were reported to be generally less than the adopted site assessment criteria, consistent with the absence of substantial contaminant mass in the overlying soils.

Notwithstanding, groundwater within the vicinity of the former dry cleaner has been reported to be impacted by CEs. Elevated concentrations of PCE, exceeding site investigation criteria (ANZAST 2018 and NHMRC 2017), were reported in offsite well JBMW02 and JBMW05, indicating that migration of the contaminants is occurring over the northern boundary via groundwater. The CE impact to groundwater was not detected in wells west of JBMW02 (JBMW01 or JBMW04) at concentrations exceeding site investigation criteria, providing delineation of the extent of significant impact.

JBS&G (2017) reported elevated concentrations TRHs in PSM01, PSM02 and PSM03, as well as elevated toluene in PSM01. Analytical results from later sampling rounds have indicated that these compounds were either not detected above the laboratory LOR or detected at substantially lower concentrations. It is considered that these compounds may have been associated with drilling advancement fluids employed as part of the geotechnical drilling methodology utilised for the installation of these wells.

Analysis of heavy metals within JBMW03 has identified arsenic and nickel at concentrations exceeding the adopted site criteria.

Groundwater at the site has been reported to be saline and unsuitable for use as drinking water. Saline groundwater was reported within the inferred upgradient well (PSM03), indicating that it is the result of background hydrogeological conditions and/or migration on to the site.

6.2.3.3 Soil Vapour and Indoor Air

Except for 134-138 and 140 Henry Street, no potential for soil-vapour or indoor air impact which may represent an unacceptable risk to future site users has been identified within the PCPV site.

6.3 Potential for Migration

Contaminants generally migrate from site via a combination of windblown dusts, rainwater infiltration, groundwater migration and surface water runoff. The potential for contaminants to migrate is a combination of:

- The nature of the contaminants (solid/liquid and mobility characteristics);
- The extent of the contaminants (isolated or widespread);
- The location of the contaminants (surface soils or at depth); and
- The site topography, geology, hydrology and hydrogeology.

The contaminants of concern identified in JBS&G (2017, 2019a and 2019b) are generally in solid (e.g. asbestos, metals and PAHs), liquid (e.g. VOCs, TPH and BTEX) or gaseous (e.g. VOCs, BTEX, Volatile TRH) form.

As the ground surfaces across the site primarily comprise sealed asphalt or concrete pavements and building footprints, the potential for windblown dust migration of contamination is generally low. The potential for contamination migration via surface water movement and infiltration of water and subsequent migration through the soil profile is considered generally to be low given the extent of impermeable pavements across the site.

The underlying natural soils at the site comprise primarily clayey soils and are relatively impermeable. Notwithstanding, CEs have been detected within groundwater (PSM01, JBMW02 and

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBMW05). On this basis, migration of contaminants via groundwater movement has been identified at the site.

Analysis of soil-vapour samples collected from shallow soils show that shallow soil vapour impacts are generally limited to 134-138 and 140 Henry Street. Deep soil-vapour samples collected on the northern side of Henry Street indicate that soil vapour impacts are present at depth beyond the northern site boundary. The scale of the impacts and generally low concentrations in groundwater imply the potential for a deep source of CEs in unsaturated horizons of soil potentially underlying Henry Street. Offsite vapour generation and transport is identified as a migration pathway.

6.4 Potential Exposure Pathways

Based on the COPC identified in various media, as discussed above, and proposed development activities, the exposure pathways for the site during and following development works are discussed below.

6.4.1 Recreational Public Open Spaces

Recreational public open spaces comprise areas which will not be used for building development (**Figure 2**). The following exposure pathways are relevant for site receptors within public open spaces:

- Potential dermal and oral contact to impacted soils as present at shallow depths and/or accessible by future service excavations; and/or
- Potential oral and dermal contact to groundwater as accessible by potential future service installation; and/or
- Inhalation of COPC vapours/gases/fibres migrating upwards from current *in-situ* soils/groundwater; and/or
- Potential contaminant uptake by vegetation proposed to be established in the vegetated areas of the site.

6.4.2 Building Development Areas

Building and development areas are shown on **Figure 2**. The following exposure pathways are relevant for site receptors within building development areas:

- Potential dermal and oral contact to impacted soils as present in areas of accessible soils and/or accessible by future service excavations; and/or
- Potential oral and dermal contact to groundwater as accessible by potential future service installations or potentially intercepted by future basements; and/or
- Inhalation of COPC vapours/gases/fibres migrating upwards or laterally (into basements) from current *in-situ* soils/groundwater; and/or
- Potential contaminant uptake by vegetation proposed to be established in the vegetated areas of the site.

6.4.3 Offsite Exposure

Potential offsite receptors of deep soil vapour impact are identified as basement occupants of 121 Henry Street, Penrith. Potential exposure is through advection of vapours from impacted soils/groundwater into the basement and inhalation by basement occupants. JBS&G (2019b) presents a vapour intrusion assessment, based on current site conditions, which indicates that no unacceptable concentrations of contaminants have been identified in indoor air within the basement of 121 Henry Street.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

The DGI provides a discussion of dilution/attenuation of contaminants within groundwater prior to discharge to the receiving water body (Peach Tree Creek), contaminant uptake by sensitive ecological receptors within the water body is considered not to be a potential exposure pathway which warrants further consideration.

Given the character of the groundwater, and the absence of identified groundwater bores within the vicinity of/downgradient of the site, potential beneficial reuse of the groundwater is not anticipated. Additionally, it is noted that groundwater is present at considerable depth below the current ground surfaces (7 to 8 m bgs). However, it has been conservatively assumed that groundwater may be intercepted by during construction of future basements within the residential/commercial precinct.

6.5 Receptors

Potential receptors of environmental impact present within the site which will require to be addressed include:

- Future occupants and/or site users who may potentially be exposed to COPC through direct contact with impacted soils, groundwater (within basements) and/or inhalation of vapours associated with impacted soils; and/or
- Excavation/construction/maintenance workers conducting activities at or in the vicinity of the site, who may potentially be exposed to COPC through direct contact with impacted soils/groundwater present within excavations and/or inhalation fibres/vapours associated with impacted soils/groundwater; and/or
- Future excavation/construction/maintenance workers who may potentially be exposed to volatile or semi-volatile COPCs through the inhalation of vapours via migration; and/or
- Current and/or future flora at the site who may be exposed to contaminants via direct uptake into root systems.

6.6 Preferential Pathways

For the purpose of this assessment, preferential pathways have been identified as natural and/or man-made pathways that result in the preferential migration of COPC as either liquids or gases.

Natural preferential pathways are likely limited to natural lithological borders, such as between porous soils and bedrock, where infiltrating groundwater is vertically confined and begins to migrate laterally.

Man-made preferential pathways are present throughout the site, generally associated with sub-surface service easements and areas of previously disturbed fill material.

The sewerage infrastructure abutting the western boundary of the former dry cleaner has been identified as a preferential pathway, and is considered likely to have potentially facilitated transport of CEs from the dry cleaner. Preferential pathways can be created by the generally higher permeability fill materials used as backfill to re-instate sub-surface service easements.

6.7 Data Gaps

Potential data gaps include:

- **AEC 1 –** Greater detail on the vertical and lateral distribution of TCE and PCE source material in soils underlying 134-138 and 140 Henry Street as inferred to be causing elevated levels of soil-vapour impact in shallow soils and at depth on the site.

  Where basements are proposed within 30 m of identified impacts, additional assessment of soil-vapour impacts is required to determine whether potential deep vapour impacts represent a risk to future developments;

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- **AEC 2 –** The occurrence of UPSS infrastructure and/or potential localized soil/soil-vapour impacts at 118-120 Henry Street;
- **AEC 3 –** Potential occurrence of impacted oils within shallow soils underlying transformers within the Allen Place Car Park; and
- **AEC 4 –** Potential occurrence of localised areas of asbestos impact and/or dissimilar fill characteristics material underlying current hardstand pavements and building footprints.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7. Remedial Action Plan

7.1 Remedial Goal

The goal for the remediation and/or management of environmental impact is to:

- Remove unacceptable risks to human populations living at/working on/visiting the site posed by impacted site media;
- Remove or manage unacceptable ecological risks to flora/fauna posed by site media;
- Complete remediation work with in accordance with the principles of ecologically sustainable development (ESD)

7.2 Extent of Remediation

Based on the CSM and consideration of the proposed development it is considered that the following scope of remedial works is required for the site:

- AEC 1: A sufficient extent of remediation and/or on-site management of CE impacted soils and local sewerage infrastructure to prevent potential unacceptable exposures to TCE and/or PCE vapours of future occupants of the parkland. This will need to consider potential additional discharge of CEs to groundwater which may result from the removal of current hardstand pavements/coverings. Removal of sewerage infrastructure will be limited to services adjoining 134-138 and 140 Henry Street to the main sewerage infrastructure junction on the southern portion of the two premises (no removal of infrastructure mains is proposed unless substantial additional impacts are identified);
- AEC 2: Potential additional remediation to remove UPSS infrastructure and associated potentially impacted soils, or otherwise manage impacted soils to prevent potential unacceptable risks to future site users (if found to be present during additional assessment, remediation and/or excavation works); and
- AEC3 and 4: Potential additional remediation to remove impacted soils underlying current pavements/buildings/transformers, or otherwise manage impacted soils to prevent potential exposures to asbestos fibres (if found to be present during additional assessment, remediation and/or excavation works).

Characterisation of groundwater undertaken to date has not identified the requirement for groundwater treatment and/or remediation. The source of groundwater impact will be managed as per the above, removing ongoing contribution of COPC. Validation that the groundwater condition remains consistent or improves and does not represent an unacceptable risk to sensitive receptors will be required by the completion of groundwater monitoring and statistical analysis (**Section 8.2.6.7)**.

7.3 Assessment of Remedial Options

The *Contaminated Land Management: Guideline for the NSW Auditor Scheme* (EPA 2017[18]) lists the following order of preference for soil remediation and management:

- On-site treatment of the soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level;
- Off-site treatment of excavated soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site;

[18] *Contaminated Land Management: Guideline for the NSW Site Auditor Scheme (3ed Edition). NSW EPA 2017 (EPA 2017)*

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Removal of contaminated soil to an approved site or facility, followed where necessary by replacement with clean fill; and
- Consolidation and isolation of the soil on-site by containment within a properly designed barrier.

In addition, it is also a requirement that remediation should not proceed in the event that it is likely to cause a greater adverse effect than leaving the site undisturbed. And, where there are large quantities of soil with low levels of contamination, alternative strategies are required to be considered or developed (EPA 2017).

Remedial options have been assessed for the site as detailed in **Table 7.1** following.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 7.1: Remediation Options Assessment Matrix

Remedial Option	Applicability	Assessment
1. On-site treatment so that the contaminants are either destroyed or the associated hazards are reduced to an acceptable level.	AEC 1 – Former Dry Cleaner COPCs: Chlorinated ethenes (PCE, TCE and DCE) All COPCS: **Active *In-Situ* Remediation:** Active remediation of soils/groundwater *in-situ* is achieved by stimulation or injection of biota, or injection of an abiotic reducing agent, which are capable of dechlorinating the COPCs. Bio-remediation of chlorinated ethenes requires reducing conditions which are unable to be readily achieved upon excavation and exposure of soils to atmospheric oxygen. **Passive *In-Situ* Remediation:** Passive remediation of soils/groundwater/soil-vapour *in-situ* is achieved by monitored natural attenuation (MNA). Natural attenuation is governed by physicochemical and biological processes which are native to the relevant aquifer/soils. **Active *Ex-Situ* Remediation:** Active remediation of soils *ex-situ* is achieved by excavation of soils and removal/destruction of COPCs, followed by replacement of soils on the site. Biological destruction of chlorinated ethenes is not readily achieved in oxygen rich environments. Bio-remediation of chlorinated ethenes requires reducing conditions which are unable to be readily achieved upon excavation and exposure of soils to atmospheric oxygen. However implementation of bio-piles may be applicable for removal of VOCs. Bio-piles consist of heaped stockpiles of the soil provided with an internal network of screened piping. Air is extracted from the screened pipe sections, by use of a vacuum pump, or by the use of passive flow devices. Collected air requires treatment/filtration to remove volatile constituents. Fresh air is drawn into the bio-piles over the remainder of the stockpile surface. High concentrations of contaminants, such as anticipated occurrences of phase separated hydrocarbon impact being present on soils, are toxic to the micro-organisms typically preventing effective remediation by bioremediation. Groundwater may be remediated via pump and treat system involving a water treatment plant. Treatment of soils and/or groundwater by highly energy intensive processes such as incineration, washing, pyrolysis and sonic treatment were not assessed given they are not in alignment with the principles of ESD.	AEC 1 COPCs: Chlorinated ethenes (PCE, TCE and DCE) Onsite treatment for removal of chlorinated ethenes is the preferred option where substantial quantities of impacted site media are identified to require treatment under the proposed development scenario. Further detail and discussion is provided below. The success of onsite/offsite treatment is dependent on many factors, including the time available for treatment and soil physicochemical properties. Where onsite/offsite treatment does not reduce COPC concentrations to acceptable levels within reasonable timeframes, Option 3 is the preferred option. All COPCs – The Preferred Option: **Active *In-Situ* Remediation:** Active remediation of *in-situ* media is not a suitable option, given the inferred low hydraulic conductivity of the impacted material which would substantially limit injection of the remediating media (biotic or abiotic). **Passive *In-Situ* Remediation:** Passive remediation via MNA is the preferred option for onsite/offsite impacts where the condition of the site is not proposed to change, and it can be demonstrated that no current/future risk to onsite/offsite receptors is present as a result of the contamination. Where no changes to the existing site condition are proposed, such as underlying the Henry Street road surfaces/footpaths, and it is demonstrated that no ongoing risk to current/future site receptors is present, MNA is the preferred option. Where existing hardstands are to be removed, exposing impacted soils, as is anticipated in the proposed public open spaces, impacted soils will require active remediation prior to implementation of MNA for groundwater/soil-vapour impacts. **Active *Ex-Situ* Remediation:** Remediation of soils by excavation and stripping of VOCs via bio-piles is the preferred option for chlorinated ethene impacted soils. This method will be appropriate for the volatile contaminant impacts where gross hydrocarbon impact is not present, however may not be suitable within clayey soils. The implementation of this method requires consideration of potential time constraints. Bioremediation may be required for extended periods (potentially exceeding six months where soils are fine grained).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Remedial Option	Applicability	Assessment
		Active groundwater treatment is not the preferred option where MNA is able to be implemented per the above. Assessment of energy intensive active treatment technologies has not been completed in detail given they are not in alignment with the principles of ESD.
	AEC 2 – Former Service Station COPCs: TRHs, BTEX, PAHs and Lead No substantial impact to either soil-vapour or groundwater has been identified at the site. Where impacts exist, it is anticipated that they are limited to minor/localised soil hotspots. TRHs and BTEX Given that soil contaminants associated with petroleum storage consist of hydrocarbon constituents, there is a potential that they may be able to be remediated on site by a bioremediation style remediation method. Bioremediation occurs where contaminants are chemically broken-down by the metabolic processes of micro-organisms into less toxic or non-toxic forms. Recent NSW EPA guidance requires bioremediation methods to demonstrate that pollutant emissions are not discharged to the atmosphere. PAHs Polycyclic aromatic hydrocarbons present in site soils are typically restricted to heavier non-volatile constituents. These can be remediated by thermal processes. However, this requires substantial investment in plant and equipment and high energy use. There are a number of microencapsulation treatment technologies which can reduce the mobility of the identified organic contaminants of concern (e.g., cement stabilisation). Lead Metals are unable to be destroyed. However, there are a number of microencapsulation treatment technologies which can reduce the mobility of the identified inorganic contaminants of concern (e.g. cement stabilisation).	AEC 2 COPCs: TRHs, BTEX, PAHs and Lead TRHs and BTEX – The Preferred Option Similar to chlorinated ethenes, TRHs and BTEX compounds are able to be removed from soils by active ex-situ remediation. Bio-piles are the most cost and time effective methodology. Given petroleum products are amenable to aerobic bio-degradation, bio-piles have the secondary benefit of stimulating biological degradation of the products, where identified. Bio-piles are the preferred remedial option where petroleum hydrocarbon impacts to soil are identified. PAHs and Lead – Not a Suitable Option Remediation options are available for PAH contaminated fill contaminants, generally restricted to thermal treatment processes which are energy intensive. These options are not considered consistent with the ESD objectives for the site. Microencapsulation is not considered necessary given the absence of identified groundwater impacts requiring remediation.
	AEC 3 and AEC 4 COPCs: TRHs, PCBs, heavy metals, PAHs, BTEX, OCPs, VOCs and Asbestos	AEC 3 and AEC 4 COPCs: TRHs, PCBs, heavy metals, PAHs, BTEX, OCPs, VOCs and Asbestos

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Remedial Option	Applicability	Assessment
	TRHs, PCBs, OCPs, PAHs and VOCs These compounds are amenable to thermal destruction. Heavy Metals Metals are unable to be destroyed. However, there are a number of microencapsulation treatment technologies which can reduce the mobility of the identified inorganic contaminants of concern (e.g. cement stabilisation). Asbestos There is no known technology to remove asbestos fibres from soils. Asbestos present in non-friable forms can be remediated by screening to remove oversize materials. However, the co-occurrence of a range of construction and demolition materials with the asbestos containing material reduces the potential effectiveness of screening processes. In addition, where asbestos fines impacts have been identified, screening of impacted material increases the risk of exposure to site workers and migration of fibres within the works area.	TRHs, PCBs, OCPs, PAHs and VOCs – Not the Preferred Option The potential quantities of these compounds within AEC 3 and AEC 4 at the site do not warrant the energy and logistical effort required to establish onsite treatment facilities. Further, the energy requirement to facilitate thermal destruction of is not in accordance with the principles of ecologically sustainable development. Heavy Metals – A Potential Option Metals are unable to be destroyed. However, there are a number of microencapsulation treatment technologies which can reduce the mobility of the identified inorganic contaminants of concern (e.g. cement stabilisation). Asbestos – Not a Suitable Option There is no treatment method available for asbestos impacts.
2. Off-site treatment so that the contaminants are either destroyed or the associated hazards are reduced to an acceptable level, after which the soil is returned to the site.	AEC 1 – Former Dry Cleaner COPCs: Chlorinated ethenes (PCE, TCE and DCE) All COPCS: Similar to Option 1, several treatment technologies exist which are capable of removing and/or destroying the COPCs	AEC 1 – Former Dry Cleaner COPCs: Chlorinated ethenes (PCE, TCE and DCE) All COPCs – The Preferred Option: Similar to Option 1 removal of COPCs from site media, and minimization of landfill contributions is the preferred option. Where substantial soil impacts are identified which require treatment, or where other COPCs such as asbestos in soils are identified, this is not a suitable option. AEC 1 to AEC 4 COPCs: TRHs, BTEX, PAHs, Where small quantities of impacted soils require treatment, this is the preferred option. Establishing onsite remediation/treatment facilities carries large establishment costs. However, additional time, energy and costs are incurred to take soils off site and return them to the site.
	AEC 2 – Former Service Station COPCs: TRHs, BTEX, PAHs and Lead	AEC 2 – Former Service Station COPCs: TRHs, BTEX, PAHs and Lead All COPCs: Not the Preferred Option

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Remedial Option	Applicability	Assessment
	No substantial impact to either soil-vapour or groundwater has been identified at the site. Where impacts exist, it is anticipated that they are limited to minor/localised soil hotspots. TRHs, BTEX, PAHs and Lead Similar to Option 1, several treatment technologies exist which are capable of removing and/or destroying the COPCs	The anticipated quantities of impacted soils, comprising minor and/or localised hotspots, does not warrant the logistical and energy investment required to export and reimport soils to the site.
	AEC 3 and AEC 4 COPCs: TRHs, PCBs, heavy metals, PAHs, BTEX, OCPs, VOCs and Asbestos Similar to Option 1, with the exception of Asbestos, these compounds are amenable to treatment.	AEC 3 and 4 COPCs: TRHs, PCBs, heavy metals, PAHs, BTEX, OCPs, VOCs and Asbestos All COPCs: Not the Preferred Option The anticipated quantities of impacted soils, comprising minor and/or localised hotspots, does not warrant the logistical and energy investment required to export and reimport soils to the site.
3. Excavation and off-site removal of the impacted soils.	All COPCs There are currently suitably licensed waste facilities in the Sydney Metropolitan region capable of accepting the identified contaminants.	All COPCs A potentially suitable option but inferior to Option 1, Option 2 and Option 4 where viable. The environmental impact of the transport of materials, waste generation and resource use in sourcing materials to re-instate the site to development levels is considered inconsistent with the principals of ecologically sustainable development. Whilst this method is viable from a technical and practical view point, as a result of resource consumption and waste generation volume considerations, this is not the most preferred remedial option available. However, where materials are identified as not being environmentally suitable under Option 1, Option 2 or Option 4, or surplus to construction requirements then this is the preferred option.
4. On-site *in-situ* management of the soil by physical separation, and ongoing management.	AEC 1 COPCs: Chlorinated ethenes (PCE, TCE and DCE) VOC impacted soils, based on the assessment to date **(Section 5** and **Section 6**), have been inferred to be the source of groundwater and soil-vapour impacts at the site. On this basis, VOC impacted soils are not suitable for retention on the site without treatment such that the VOCs are reduced to an acceptable level.	AEC 1 COPCs: Chlorinated ethenes (PCE, TCE and DCE) Not a suitable option.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Remedial Option	Applicability	Assessment
	AEC 2, AEC 3 and AEC 4 COPCs: TRHs, PAHs, Heavy Metals, OCPs, PCBs, VOCs and Asbestos Volatile COPCs (v-TRH, BTEX and VOCs) Where present, v-TRHs, BTEX and VOCs represent unacceptable migration risks and are not readily encapsulated by onsite retainment technologies. Non-volatile COPCs (sv-TRH, PAHs, heavy metals, OCPs, PCBs and Asbestos) Fill materials, based on the assessment to date (refer to **Section 5** and **6**), have been found to be largely free of constituents at concentrations which pose an unacceptable risk to future site users under the proposed development scenario. Notwithstanding, the potential for these constituents to be present in soils not yet assessed at the site exists. Assessment conducted hitherto has not identified potential impacts in soils: • That will pose a potential groundwater risk by the demonstrated absence of significant groundwater impact attributable to the site; and • That will pose a potential inhalation risk as demonstrated by the assessment of vapours. On this basis, the fill materials potentially contaminated by these compounds are likely to be suitable for retention on the site in areas where direct contact human/ecological exposures can be restricted. Where materials are identified as not being suitable for containment, Option 3 is the preferred remedial strategy.	AEC 2, AEC 3 and AEC 4 COPCs: TRHs, PAHs, Heavy Metals, OCPs, PCBs, VOCs and Asbestos Volatile COPCs (v-TRH, BTEX and VOCs) Not a Suitable Option Non-volatile COPCs (sv-TRH, PAHs, heavy metals, OCPs, PCBs and Asbestos) The preferred option. The retention of the materials will reduce the waste generation and resource requirements of the remediation of the site, as consistent with the ecologically sustainable development. The PCPV will be subject to significant areas of building and pavements which will provide physical separation between site users and retained impacted fill materials if present. This option is of highest ranking with respect to the ecologically sustainable development principles as a result of the low waste volumes and energy use. However, consideration of the practical implications of an ongoing site management is required prior to implementation where impacted materials are proposed to be retained.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.4 Proposed Remedial Approach

As shown in **Table 7.1**, with consideration to EPA (2017) hierarchy for remediation and the principles of ecologically sustainable development the remediation strategy for the proposed development is presented below.

- **AEC 1** – Delineate the extent of impacted soils via soil vapour assessment. Remove all impacted soils and local sewerage infrastructure servicing 134-138 and 140 Henry Street premises. Where onsite treatment is not viable or is unsuccessful, dispose of impacted soils to landfill.

  The anticipated maximum extent of impacted soils within the PCPV site is shown on shown on **Figure 6**. Soil impacts may extent north, into Henry Street, however this is outside of the PCPV project site. Based on the lateral extent occupied by 134-138 and 140 Henry Street, the anticipated maximum extent of VOC impacted soils which remediation is less than 1600 m^3.

- **AEC 2** – Ascertain whether UPSSs exist within 118-120 Henry Street.
  - If UPSSs are identified, remove to a disposal facility, assess surrounding soils to determine whether impacts are present. Excavate impacted soils (if present) and treat on-site. Where onsite treatment is not viable or unsuccessful, dispose of impacted soils to landfill;
  - If impacted soils are identified, excavate impacted soils and treat on site. Where onsite treatment is not viable or unsuccessful, dispose of impacted soils to landfill; and
  - If neither UPSSs or soils are identified, no remediation for AEC 2 required;

  The extent of potentially impacted media within AEC 2 is limited to soils in the vicinity of the UPSS (if present). Gross and/or widespread soil, groundwater and soil-vapour impacts within AEC 2 have not been identified.

- **AEC 3** and **4** – Ascertain whether residual soil impacts exist underlying current buildings/transformers (per **Section 7.6.3**).
  - If impacts are identified, preferentially retain the material onsite under a suitable cap covering to preclude future direct contact by human and ecological site receptors. Where onsite retention is not possible, or redevelopment works result in soils being surplus to development requirements, excavate impacted soils and dispose to landfill;
  - If no residual impacts are identified, no remediation for AEC 3 and AEC 4 is required.

If impacts are identified with AEC 2, AEC 3 or AEC 4 which require onsite retention, the proposed physical separation arrangements, providing physical separation from retained fill are presented in **Sections 7.6.5** (landscaped areas) and **7.6.8** (road reserves/paved areas). Soils moved within the site will require a material tracking system to be implemented during works (as described in **Section 7.6.12**).

If volatile contaminant impacts are identified within any of AEC 2, AEC 3 or AEC 4 during remediation works, potential for the generation of vapours needs to be assessed to determine whether implementation of a 'cap/cover' remedial strategy as indicated in ANZECC (1999), in conjunction with appropriate control measures, is appropriate with respect to management of the health risk.

7.5 Regulatory and Planning Requirements

The following planning requirements for the proposed remedial works are presented.

Environment Planning and Assessment Act 1979/SEPP 55

Under Clause 9 (d) of SEPP 55, remediation work is considered Category 1 remediation work (i.e., requiring development consent) when the development for which another State environmental

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

planning policy or a regional environmental plan requires development consent. The site is located within the boundary of the Sydney Regional Environmental Plan No. 20 – Hawkesbury-Nepean River (No .2 – 1997) (SREP20) and therefore any remediation works require development consent under SREP20. Clause 11 (4) of SREP20 requires consent for remediation.

On this basis, the proposed remedial works at the site are considered to be Category 1 Remedial Works (as per SEPP 55) and require consent.

The nature of remediation works is relatively well understood and it is considered most appropriate that development applications for remediation works are included with DA documentation for the associated earthworks as ancillary to other development. Where development proceeds in stages, which preclude readily completing concurrent remediation and site redevelopment, a separate planning consent may be required to complete remediation of the site.

Environment Planning and Assessment Regulation 2000 – Schedule 3 Designated Development

The proposed remediation works do not constitute designated development. With reference to the triggers listed in Schedule 3, the following commentary is provided:

- Remediation of the site will not comprise treatment or storage of contaminated soil not originating from the site; Remediation will not affect an aggregate area exceeding 3 hectares;
- The proposed remediation works will not incorporate on-site treatment by any means of soil in exceedance of 30 000 m^3; and
- The proposed remediation works will not incorporate treatment by incineration of more than 1000 m^3

Protection of the Environment Operations Act 1997

All potential discharges from the site during remediation works will require to be maintained below applicable assessment criteria/threshold guidelines during the remediation works. This would apply to potential emissions in air, water and discharges to groundwater. Levels of discharges are typically assessed at a site boundary.

The proposed remediation/validation activities are not required to be licensed under the Protection of the *Environment Operation Act (1997)*. The site is less than 3 ha in area, does not store greater than 30 000 m^3 of contaminated fill and hence does not trigger the licensing requirements.

Water Management Act 2000

Should dewatering be required, a dewatering and potentially a re-injection approval will be required from the NSW Department of Primary Industry - Water (DPI-Water) for any dewatering proposed with the site works. The approval will require to be obtained prior to the undertaking of any groundwater dewatering and treatment. Depending on the depth of proposed basements, temporary dewatering may be required.

Protection of the Environment Operations (Waste) Regulation 2014

The regulations make requirements relating to non-licensed waste activities and waste transporting. The proposed works will not require to be licensed. Section 48 of the Reg. requires that wastes are stored in an environmentally safe manner. It also stipulates that vehicles used to transport waste must be covered when loaded. This regulation also details additional tracking requirements for vehicles carrying Special (Asbestos) waste.

Provision is provided in the Regulation and EPA (2014a) guidelines for the NSW EPA to approve the immobilisation of contaminants in waste (if required).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

It is noted that no waste will be received at the site and only VENM, excavated natural material (ENM) or materials covered by a NSW EPA exemption will be imported to the site.

Protection of the Environment Operations (Underground Storage Systems UPSS) Regulation 2014

The removal of UPSSs (if present) will be undertaken in accordance with WorkCover NSW requirements and a validation report will be provided in accordance with the provisions of the *Protection of the Environment Operations (UPSS) Regulation 2014*. The validation process in this RAP meets the requirements of the regulation.

Waste Classification Guidelines (EPA 2014a[19])

All wastes generated and proposed to be disposed off-site shall be assessed, classified and managed in accordance with this guideline. Where wastes require immobilisation prior to off-site disposal (to reduce waste classifications) an immobilisation approval shall be sought in accordance with Part 2 of this guideline. Immobilisations are only anticipated to be required with unexpected finds.

NSW Aquifer Interference Policy (NSW Office of Water 2012)

Groundwater underlying the site will potentially be classified as an aquifer as per the policy. The policy does not apply to the site development as any works proposed to be undertaken within the saturated portion of the site will not contaminate groundwater (as assessed by comparison to applicable standards and guidelines) and will not cause an unacceptable loss of storage or cause structural damage to the aquifer.

Penrith City Council 'Penrith Development Control Plan 2014'

The Council development control plan (DCP) provides a number of environmental and site management provisions required to be employed during remediation works. These have been incorporated into this RAP as minimum standards for the environmental management of remediation works.

Work Health and Safety Act 2017 No 10 and Work Health and Safety Regulation 2017

The information and data provided in this RAP should be considered by the Principal/Remediation Contractor in preparation of their health and safety plans for the remedial works.

7.6 Remedial Scope of Works

It is envisaged that remedial and validation works will be potentially conducted as a staged process as required for the site development. Within each proposed stage, remediation works will comprise, where appropriate the following actions.

7.6.1 Site Establishment

For each stage of remediation works the boundary will be defined (via survey) and secured as appropriate to ensure that all safety and environmental controls are implemented, including necessary contractor briefings and inductions for the remediation workforce. A summary of the controls is provided in **Section 10**.

7.6.2 Demolition of Overlying Buildings and Current Hardstands

Buildings and pavements currently present at the site are anticipated to be demolished to facilitate the proposed development. The demolition will expose underlying impacted soils and areas requiring additional assessment.

[19] Waste Classification Guidelines – Part 1: Classifying Waste. NSW EPA 2014 (EPA 2014a)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Premature exposure of impacted soils within AEC 1 may result in additional recharge (by rainfall or other surface water infiltration) through impacted unsaturated soils. Hardstand pavements overlying AEC 1 will be maintained in reasonable condition until the area is to be remediated.

7.6.3 Refine Remedial Extents

Subsequent to demolition of overlying buildings and hardstand pavements, formerly capped AECs will be exposed and available for additional assessment. The following assessment activities will be undertaken to refine the remedial extent:

- **AEC 1**: Remedial extents for AEC 1 will be refined in accordance with the following program:
  - A Vapour Sampling, Analysis and Quality Plan (VSAQP) will be prepared to inform the requirements of the relevant RWP(s). The VSAQP will stipulate the requirements of a soil-vapour screening assessment on an approximate 5 m grid within the footprint of 134-138 and 140 Henry Street. The soil vapour assessment will be undertaken by installation of temporary multi-level soil vapour probes. Probes will be screened onsite with a compound specific GC-PID, and subsequent confirmatory sampling/analysis using a carbon tube methodology, to determine the extent of impacted soils generating unacceptable concentrations of soil-vapour contamination. The anticipated remedial extent will be informed by trigger levels derived through a development specific risk assessment;
  - Where building development potentially includes multilevel basements, delineation of deep soil-vapour impact extending east of AEC 1. Determination will be made based on the location of proposed basements and relative distance to identified soil-vapour/groundwater impacts and requirements for remediation/management and validation will be included in the relevant RWP(s).
- **AEC 2:** upon demolition of the overlying building at 118-120 Henry Street, assessment for the potential presence of UPSSs will be undertaken. Inspection of the ground surfaces for fill/vent points and scanning with a Ground Penetrating Radar will be undertaken. Fill material will be assessed for the presence of potential petroleum hydrocarbon related impacts by collection and laboratory analysis of samples from four locations across the property as collected via test pit excavation methodology;
- **AEC 3:** Soils underlying current transformers will be assessed by collection/analysis of soil samples. Where no indicators of contamination (staining, odours, free oils, etc.) are identified, one sample is proposed to be analysed from soils with anticipated highest probability of impact underlying each transformer. Should gross indicators of impact be identified, or preliminary results identify contaminated soils, further sampling analysis will be required to determine the extent of impact/remediation. Samples will be assessed for TRHs and PCBs; and
- **AEC 4**: The site fill material has been broadly characterised, however limited site access has precluded assessment of soils underlying current buildings. Soils underlying current buildings will be assessed for the presence of COPCs via test pits. The required number of test pit locations for each building is presented following:
  - Lot 1 DP 526304, Lot E EP 163176, Lot 2 DP 556075 – one location;
  - Lot 11 DP 556665 and Lot 1 DP 164798 – two locations; and
  - Lot 10 DP 553665, Lot 1 DP 113118 and Lot 1 DP 545578 – four locations.

  Test pits will be advanced to a depth of at least 0.5 m into undisturbed natural materials. Soil samples will be collected from fill material analysed for a range of COPCs (**Table 6.1**). Where elevated total soil concentrations are identified, leachate samples will be prepared to determine whether any risk to groundwater is present.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.6.4 Excavation of Impacted Soils

Soils within the footprint of 134-138 and 140 Henry Street and any soils identified as exceeding validation criteria (as derived in the VSAQP or generic criteria presented herein i.e. NEPC (2013)) are required to be excavated and separated from the balance of the site fill materials/natural soils. The inferred extent of the dry-cleaner remediation area is shown on **Figure 6**.

VOC impacted fill material will be refined by future pre-remedial investigation works advised by VSAQP. Upon excavation to the inferred remedial extent, confirmatory field screening and laboratory analysis of soil-vapour will be undertaken to ensure that unacceptable levels of soil-vapour contamination are not present within the residual soils, with risk-based action criteria provided in the VSAQP. Excavated fill materials will be temporarily stockpiled. Stockpiling shall be undertaken to restrict potential environmental emissions in accordance with the requirements of the REMP as discussed in **Section 10**.

The volume of potentially impacted shallow sub-surface soils (based on distance between vapour samples with no HIL-B/HIL-C soil-vapour exceedances, and an average depth of impact of 2 m) is estimated to be 1600 m^3.

Deep soil vapour impact has been identified offsite however the general absence of sub-slab vapour contamination (as evidenced by JBS&G (2019a)) indicates that deep sub-slab vapour contamination is not migrating to the ground surface. Potential migration of vapours back onto the site upon removal of impacted site soils will be considered where basements are proposed per the data gaps discussed in **Section 6.7** and as part of the validation process discussed in **Section 8**.

Petroleum hydrocarbon or other impacted soils (if identified) will be remediated as discussed below or removed from the site to a facility lawfully able to accept the material.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.6.5 Treatment of Chlorinated and Petroleum Hydrocarbon Impacted Soils

Chlorinated ethene impacted soils and, if identified during remedial extent refinement, petroleum hydrocarbon impacted soils shall be treated within the site, where practicable. Treatment will be undertaken by bioremediation and/or compound removal as conducted within biopiles.

Compound removal is completed by stripping chlorinated ethenes from soil surfaces and adsorption of compounds on to an adsorptive media (e.g. activated carbon). Bioremediation is stimulated by increasing oxygen content within the soils to cause aerobic decomposition of petroleum hydrocarbons. Bio-piles will be constructed and operated in a manner that achieves the bioremediation outcomes for the soils while eliminating the potential for environmental emissions. Bio-piles shall be constructed and operated as per the following general specifications:

- Bio-piles shall not exceed 2 m in height;
- Bio-piles shall be provided with screened/slotted piping (i.e. ag line or similar) throughout the stockpiled material. Piping shall be provided at a typical 0.5 m spacing throughout the bio-pile and screened/slotted sections shall be covered by soils within the stockpile;
- Air shall be drawn through the slotted pipes. This causes air to be drawn into the bio-pile and air emissions from the bio-pile (which is anticipated to be malodorous) to be received at a common discharge point; and
- Air emissions shall be filtered through a granular activated carbon (GAC) filter prior to discharge to the atmosphere.

The bio-pile will be covered. The bio-pile will require to be periodically watered to maintain moisture conditions within the soils for bio-remediation. The GAC filter shall be sized on the basis of the size of the bio-pile and observation of emissions from the GAC filter. Where malodorous emissions are observed through the GAC filter, additional filter media shall be required.

Treatments works are required to be undertaken in accordance with *Best Practice Note: Landfarming, NSW, EPA* 2014b. Specific details of the treatment methodology, associated controls and required validation will be provided in relevant RWP(s).

Where the practicality of landfarming is hindered by redevelopment specifics (timing, available space, community objection, etc.) then impacted soils will be disposed of from the site to landfill. Details of the contingency will be provided in the relevant RWP(s).

7.6.6 Physical Separation

If non-leaching/non-volatile soil contamination is identified during remedial extent refinement, the impacted soils will be preferentially retained on site. If the soils are demonstrated as being suitable for retention on site subject to removal of direct contact exposure, then the following procedure will be implemented.

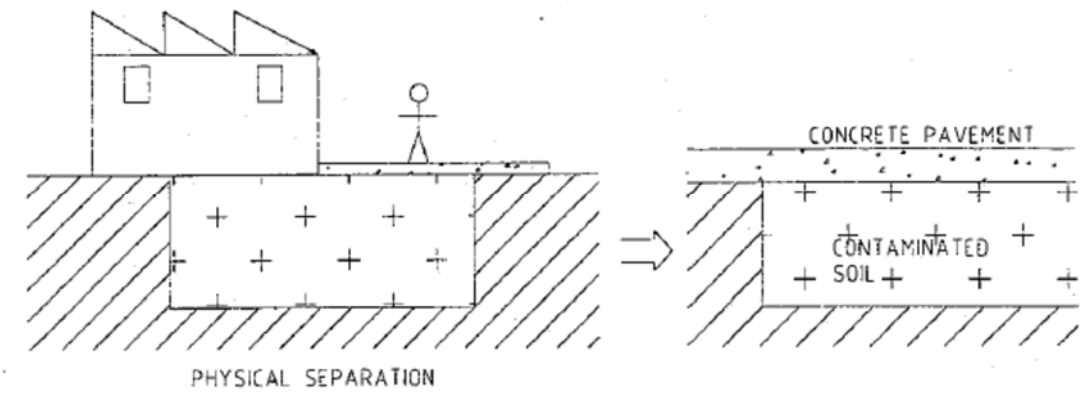
The principal of the on-site management approach within the site is to retain materials in-situ by providing physical separation between impacted fill/soil materials and receptors (e.g. site users, flora or fauna). The management approach prevents direct contact via permanent pavements/minimum soil thickness arrangement (i.e. physical separation), and implementation of a long-term EMP to maintain the physical separation arrangements.

The minimum typical requirements in ANZECC (1999) for physical separation include:

- Permanent concrete floor slab or asphalt surfaced pavement. The pavement outside of the building footprint shall be underlain by a marker layer; or
- A thickness of soil that is unlikely to be penetrated by future users of the site. A minimum soil cover thickness of 0.5 m is nominated as underlain by a layer of ‘marker layer’ in areas of exposed site soil (i.e. landscaped beds and parklands).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

As shown schematically below:



Source: ANZECC (1999)

The marker layer shall consist of orange geofabric. The specific details of the marker layer will require to be included in the validation report and long-term EMP documents in addition to plans showing the extent of capped area within the site.

Material above the marker layer extending to the final finished ground level will be required to be environmentally suitable material for human and/or ecological exposure (as appropriate). These physical separation arrangements shall generally comprise growing media, but may potentially comprise material originating from within the site validated as suitable for reuse in accordance the requirements outlined in **Sections 8**; imported VENM or material certified in accordance with an exemption issued by the NSW EPA. Where materials are proposed for beneficial reuse under a NSW EPA exemption (i.e. imported to the site), fill material will need to be further assessed for land use suitability. Sampling densities and analysis for COPC will be dependent on the volume, material type, source and subject to Site Auditor endorsement and acceptance.

Installation of physical separation arrangements shall be defined by survey as completed by a registered surveyor and/or building as-built drawings sufficient to identify:

- The lateral extent and upper depth height of known environmentally impacted materials (i.e. residual fill materials underlying the cover) within each remediation area/stage;
- The lateral extent and type of cover (e.g. permanent pavement) within the remediation area/stage; and
- Confirmation, by photos or otherwise, of the installation of the 'marker layer' underlying the cover (as required).

A thicker cap may be required in areas of deep planting and/or service installation. Detailed cap construction requirements are required to be provided within relevant RWP(s).

7.6.7 Importation and Off-site Disposal of Fill Materials

Reference should be made to **Section 8** for sampling densities and analytes and compliance with relevant EPA made or endorsed guidelines.

7.6.8 Asbestos Management

Based on the available site characterisation information as discussed in **Section 5**, fill materials within the site have been assessed for the presence of asbestos in soils and have been found to be largely free from asbestos impacts. Notwithstanding, the potential for asbestos impacts to be identified in shallow fill materials upon demolition and removal of overlying hardstands. Given the identification of building and demolition wastes in fill across the site, and the identification of asbestos in soils at location JB11, fill material within the vicinity of this location (as shown on **Figure**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6) is required to be considered as potentially impacted with asbestos fibres, and are provisionally classified as asbestos contaminated soils in accordance with the Work Health and Safety Regulation 2017 until deemed otherwise.

Soil asbestos concentrations are not in exceedance of site suitability criteria, and remediation of soils to remove asbestos impacts is not required for the purpose of making the site suitable for the proposed development. Notwithstanding, management of asbestos is required during development works to ensure that workers and/or offsite receptors are protected.

Asbestos contaminated soil necessitating management for potential asbestos exposure is defined in *How to Manage and Control Asbestos in the Workplace Code of Practice*, 2016, Safe Work Australia/NSW WorkCover 2016 (SWA 2016/NSW WorkCover 2016) as:

- Soil that contains visible asbestos as determined by a competent person; or
- Soil that contains asbestos fibres at quantities exceeding trace levels (considered to be the analytical detection limit in lieu of alternate guidance) as reported by analysis undertaken in accordance with AS4964:2004 *Method for the qualitative identification of asbestos in bulk samples*.

Environmental, health and safety management requirements for the handling of these materials will be based on the requirements provided for asbestos-related works in SWA 2016/NSW WorkCover 2016. This will include preparation of an asbestos register and associated asbestos removal control/management plan as outlined in SWA 20161/NSW WorkCover 2016.

Where sampling and analysis of specific fill materials is completed in conjunction with inspection by a competent person, and the results indicate the material does not fall within the “asbestos contaminated soil” definition, the requirements for management of “asbestos contaminated soils” will not be required to be implemented. The extent of asbestos contaminated soils may be further delineated within a work stage by a similar assessment (i.e. identification of asbestos contamination hotspots).

For the purposes of remediation works within the site, a competent person shall be considered to be a person who holds a tertiary degree in an environmental discipline, has experience in contaminated site assessment and has completed a WorkSafe approved Asbestos Removal Supervisor course.

7.6.9 Movement of Material

Movement of materials will be required at the site and shall be moved as per a material tracking plan as documented following. The tracking system is designed to track the quantity and quality of materials from their arrival on site or their derivation point, through temporary storage to placement.

The system comprises the following elements;

- Definition of Roles and Responsibilities;
- Material quality information;
- Material movement tracking;
- Material emplacement;
- Documentation required;
- Dealing with non-conformance; and
- Dealing with expected and unexpected finds.

7.6.9.1 Roles and Responsibility

The Principal Contractor will be responsible for the following:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Implementation and overall management of onsite procedures and protocols defined in the RAP document.
- Responsible for ensuring all subcontractors and consultants employed in reuse material classification generation, movement and placement are adequately briefed in the requirements of the RAP.
- Will take ultimate responsibility for the movement and placement of materials intended for reuse.
- Will ensure clear lines of communication are maintained between all relevant responsible parties.
- Will be responsible for liaison with suppliers in sourcing of materials from offsite, whether imported VENM or material under a NSW EPA exemption.
- Responsible for ensuring the RAP is operated effectively in conjunction with other relevant documents and in line with the overarching Health, Safety and Environmental Plan, Asbestos Management Plan to be developed for the site.

Environmental Consultant will be responsible for the following:

- Liaise with the Principal Contractor with regards to the importation of materials which does not meet the definition of VENM to ensure materials meet the project requirements and to prevent unsuitable materials being inadvertently brought onto the PCPV, such that the site cannot be validated as suitable for proposed permissible uses.
- Undertake inspections when material importation works are being undertaken to confirm materials sampled are consistent with those being imported.
- Review materials tracking documents submitted by the Principal Contractor and investigate/resolve any discrepancies.
- Cross check inspection findings with materials tracking sheets.
- Provide directives (decisions) relating to a proposed and/or placed fill materials suitability.

7.6.9.2 Material Tracking

The movement of classified materials within the site will be controlled by an appropriately managed Materials Tracking System, as discussed below.

In order to minimize double handling on the site, improve cost effectiveness and reduce environmental impacts, every effort should be made to facilitate the movement of excavated or imported material directly to the area of placement.

It is, however, recognized that this objective may not always be practical and hence the following range of potential material movements is anticipated:

- Stockpile to Placement;
- Import to Emplacement;
- Import to Stockpile;
- Stockpile to Stockpile; and
- Offsite disposal.

7.6.9.3 Materials Characterisation Form

All material movements within the site will be controlled using Materials Classification Forms (MCF) and Material Tracking Sheets (MTS).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Each MCF outlines procedures for confirming material quality, quantity and summarising existing analytical data. The MCF will be completed by the Principal Contractor and/or the Civil Works Contractor and will include the following:

- A unique MCF document name/number;
- A summary of VENM/ENM reports prepared the Environmental Consultant;
- Materials description; and
- Material reuse suitability summary.

Each MCF will be completed and signed off by the Principal Contractor/Civil Works Contractor based on material characterisation reports prepared by Environmental Consultant. Once completed, the MCF will be incorporation into the Principal Contractors materials tracking system prior to placement within the site.

An example of the MCF is presented in **Appendix F**.

7.6.9.4 Materials Tracking Sheet

The MTS is a two-part document which requires information to be collected at the material source location and at one of the three potential destination sites. An example of the MTS is presented in **Appendix D**.

All MTSs will be uniquely referenced and stored as a record of material movements.

This first part (Part A) of the document will record the following data:

i. Time and Date
ii. Truck registration or plant identification;
iii. Load quality; and
iv. MCF reference name/number. The MCF will provide details on items such as a source location reference, visual/olfactory observations, materials classification/reuse zone suitability summary.

The document will also be used for materials required for onsite placement or temporary stored prior to placement and will be completed at the point of unloading. The sheet will record the following details:

- Items i, ii, iii, as above;
- Visual and olfactory observations; and
- Zone of emplacement.

The final portion of the sheet (Part B) will be completed for materials which cannot be used within the site and are scheduled for off-site disposal in accordance with EPA (2014).

Items I, ii, iii and iv above will be recorded initially. The name of the haulage company responsible for transferring the material to the tip site and the details of the receiving site must also be recorded. Prior to leaving the site, the material should have undergone a waste classification in accordance with EPA (2014) and confirmation of this should be acknowledged on the sheet.

Finally, a note should be made of the consignment note number or receipt identification obtained.

The MTS will be reviewed and signed off as completed by the Principal Contractor and or Civil Works Contractor.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.6.9.5 Material Placement

Zones (grid references) of material placement will be accurately surveyed. This will allow the interrogation of the data set to ensure reuse material loads have been correctly deposited and a record kept of cumulative loads deposited in any particular zone.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8. Validation Plan

8.1 Overview

Validation data is required to be collected to verify the effectiveness of the remedial works and document the final site condition as being suitable for the proposed future use(s).

The following sections establish the DQOs to be adopted during validation of the remediation works.

8.2 State the Problem

The site, which has historically been used for commercial/industrial activities, is proposed to be redeveloped for mixed use (residential, public open space and commercial land uses).

Past assessment activities, as summarized in JBS&G (2017 and 2019a) and **Sections 5** to **7**, have identified that, prior to redevelopment, remediation of contamination is required.

During remediation activities, sufficient validation data is required to demonstrate that the identified environmental and health risks to future user(s) of the site have been adequately managed to render the site suitable for the proposed land use.

8.2.1 Identify the Decision

The decisions which are required to be made for validation of the site are:

- Have all VOC impacted soils representing a potential unacceptable human health/ecological risk been successfully treated/removed from the site?
- Where assessment of AEC 2 (former service station), AEC 3 (transformers) and AEC 4 (fill material) have identified residual, localised contamination:
  - Has all petroleum infrastructure and associated contaminated soils representing a potential unacceptable human health/ecological risk under the proposed development scenario been successfully treated/removed from the site?
  - Has all contaminated fill material which represents a potential unacceptable human health/ecological risk with respect to the proposed development scenario been successfully treated/removed from the site?
- Where impacted material which is demonstrated as being environmentally suitable for retention on site under a cap/cover physical separation, have marker layer and physical separation arrangements been installed appropriately and in accordance with RAP requirements?
- Are accessible soils ecologically suitable?
- Are imported soils (where required) ecologically suitable for their proposed use?
- Are offsite concentrations of chlorinated ethenes in groundwater stable or decreasing?
- Is an EMP required to address management of any residual contamination?
- Is the site suitable for the proposed use?

8.2.2 Identify Inputs to the Decision?

Inputs to the decisions are:

- All available site characterisation data collected up to the completion of site validation.
- Field observations in relation to inspection of all excavation bases, walls and stockpiles for odours, sheen, discolouration, and other indicators of potential contamination;
- Ground Penetrating Radar (GPR) survey information;

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Soil and soil-vapour validation analysis data collected from stockpiles and the base and walls of remedial excavations;
- Groundwater validation analytical data collected from monitoring wells installed within and nearby to the site;
- Waste classification and/or material characterisation data obtained during assessment of fill materials/soils;
- Materials tracking records;
- Importation characterisation assessments;
- Disposal dockets and relevant documents in relation to appropriate disposal of material to be removed from site as part of the remediation works (landfill dockets, tank destruction certificates, beneficial reuse/recycling dockets, etc.);
- Survey data in areas of fill retention;
- Survey data as to the extent and thickness of physical separation arrangements and extent of environmentally impacted materials; and
- Data quality indicators as assessed by quality assurance/quality control (QA/QC).

Specifically, sufficient data needs to be collected from each of the identified potentially impacted media (e.g. soils, groundwater and soil-vapour) across the site to demonstrate that the associated COPCs (**Section 7**) have been removed or reduced to an acceptable level.

8.2.3 Define the Study Boundaries

The site comprises 10 legal properties (**Table 3.1**) and occupies an area of approximately 1.87 ha as shown on **Figures 1** to **4**. The study boundary extends north of the site, the final extent of which will be subject to future assessment works, to determine potential offsite migration of impacts. The surrounding land uses of the site is bound by Henry Street, Allen Place, Station Street and Woodriff Street North.

The vertical extent of the works will be the maximum depth from which impacted soils will be excavated/treated.

Validation works will be completed within development timelines to be informed upon development of detailed design proposals.

8.2.4 Develop a Decision Rule

Decision rules are provided following for each of the decisions:

- Have all chlorinated ethene impacted soils representing a potential unacceptable human health/ecological risk been successfully treated/removed from the site?
    - If all chlorinated ethene impacted soils representing an unacceptable risk to future receptors underlying 134-138 and 140 Henry Street have been removed/treated, the removal confirmed by comparison of soil leachate (against screening criteria from ANZAST 2018 95 % and NHMRC 2017 recreational exposure values) and soil-vapour analytical results against the interim soil vapour health investigation levels for volatile organic chlorinated compounds (NEPC 2013) and soils have been disposed of in accordance with EPA waste guidelines or been assessed as suitable for retention following remediation then the decision will be Yes. Otherwise the decision will be No and additional assessment and/or remediation will be required to demonstrate the objectives of the RAP have been achieved;

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Where assessment of AEC 2 (former service station), AEC 3 (transformers) and AEC 4 (fill material) have identified residual, localised contamination:
  - Has all petroleum infrastructure and associated contaminated soils representing a potential unacceptable human health/ecological risk under the proposed development scenario been successfully treated/removed from the site?
    - If all petroleum hydrocarbon contaminated soils have been removed/treated, the removal/treatment confirmed by assessment of residual soil COPC concentrations and the NEPC (2013) criteria, and soils/infrastructure have been disposed of in accordance with EPA waste guidelines or been assessed as suitable for retention following remediation then the decision will be Yes. Otherwise the decision will be No and additional assessment and/or remediation will be required to demonstrate the objectives of the RAP have been achieved;
  - Has all contaminated fill material which represents a potential unacceptable human health/ecological risk with respect to the proposed development scenario been successfully treated/removed from the site?
    - If all contaminated soils have been removed/treated, the removal/treatment confirmed by assessment of residual/treated soil COPC concentrations and the NEPC (2013) criteria, and soils have been disposed of in accordance with EPA waste guidelines or been assessed as suitable for retention following remediation then the decision will be Yes. Otherwise the decision will be No and additional assessment and/or remediation will be required to demonstrate the objectives of the RAP have been achieved;
- Where impacted material which is demonstrated as being environmentally suitable for retention on site under a cap/cover physical separation, have marker layer and physical separation arrangements been installed appropriately and in accordance with RAP requirements?
  - The marker and physical separation arrangements must be installed across the extent of the impacted soils. The marker layer must be installed to the RAP requirements, as well as the manufacturer's installation requirements (**Section 8.2.6**). The vertical and lateral extents of the marker layer must be surveyed, along with consistent and comprehensive photographic evidence.
  - Where soil-based material is to be used for physical separation, placed above the marker layer and readily accessible to human users, this material is required to be validated as meeting the site validation requirements as discussed in **Section 8.7**.
  - All imported materials to be used as the physical separation arrangement must be environmentally suitable, as defined below. Growing media should have levels of constituents consistent with ecological protection criteria for 'urban residential and public open space' as provided to NEPC (2013).
  - If the marker layer and physical separation arrangements have been installed with the requirements of the RAP, then the answer will be Yes. Otherwise the decision will be No and additional assessment and/or remediation is required to demonstrate the objectives of the RAP have been achieved.
- Are accessible soils ecologically suitable?
  - If concentrations of COPCs in soils proposed to be used for establishment of site vegetation are below EIL/ESL criteria, the answer to the decision is yes.
- Are imported soils (where required) ecologically suitable for their proposed use?

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- If imported soils are comprised of VENM or ENM and they are used in accordance with the relevant exemptions, and analyte levels within the soils meet all the adopted ecological and human health criteria (**Section 8.5**) for accessible soils on the site then the decision will be Yes. Otherwise the decision will be No.

- Subsequent to the removal/treatment of chlorinated ethene impacted soils are groundwater chlorinated ethene concentrations stable/decreasing?
  - If an assessment of the attenuation of groundwater VOC concentrations demonstrated by either direct measurement of decreasing concentrations, or stable concentrations and secondary indicators of attenuation, then the answer to the decision was Yes. If No, further remediation/ongoing monitoring may be required to address outstanding contamination issues.
- Subsequent to the removal/treatment of chlorinated ethene impacted soils, and establishment that groundwater chlorinated ethene concentrations are stable/decreasing, do residual offsite concentrations of groundwater represent an unacceptable risk to sensitive downgradient receptors?
  - If assessment of the groundwater (by either site specific risk assessment and/or delineation of the plume extent) indicate that no potentially unacceptable risks are posed to sensitive downgradient receptors, the answer to the decision is No. Otherwise further remediation/ongoing monitoring may be required to address outstanding risks.
- Is an EMP required to address management of any residual potential contamination?
  - Was the answer to any of the above decisions No, or were any contaminated fill materials retained on site below a marker layer? If Yes, the issues are required to be documented within an EMP to be prepared for the site to address outstanding contamination issues. If No, an EMP is not required to be prepared for the site to address outstanding issues.
- Is the site suitable for the proposed use?
  - Was the answer to any of the above decisions No? If No, were the outstanding issues appropriately addressed by implementation of an EMP to the satisfaction of the auditor?
  - If the answer to the first question was Yes, or if the issues were appropriately addressed by an EMP, the answer to the above decision will be Yes. Otherwise, the answer to the decision will be No and additional remediation/management will be required.

8.2.5 Specify Limits of Decision Error

This step is to establish the decision maker's tolerable limits on decision errors, which are used to establish performance goals for limiting uncertainty in the data. Data generated during this project must be appropriate to allow decisions to be made with confidence.

Specific limits for this project have been adopted in accordance with the appropriate guidance from the NSW EPA, NEPC (2013), ANZECC (2000), DEC (2007[20]), appropriate indicators of data quality (DQIs used to assess QA/QC) and standard JBS&G procedures for field sampling and handling.

To assess the usability of the data prior to making decisions, the data will be assessed against pre-determined DQIs for completeness, comparability, representativeness, precision and accuracy.

The pre-determined Data Quality Indicators (DQIs) established for the project are discussed below in relation to precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS parameters), and are shown in **Table 9.1**.

[20] *Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination*. NSW Department of Environment and Conservation 2007 (DEC 2007)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- **Precision** - measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples.
- **Accuracy** - measures the bias in a measurement system. The accuracy of the laboratory data that are generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- **Representativeness** –expresses the degree which sample data accurately and precisely represent a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
- **Comparability** - expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; ensuring analysing laboratories use consistent analysis techniques and reporting methods.
- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.
- **Sensitivity** – expresses the appropriateness of the chosen laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted criteria.

If any of the DQIs are not met, further assessment of the data set will be required in order to determine whether the non-conformance has significant effects on the usefulness of the data. Corrective action to correct an adverse impact on the reliability of the dataset may include, but is not limited to, the request of further information from samplers and/or analytical laboratories, downgrading of the quality of the data or alternatively, re-collection of the data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 8.1: Summary of Quality Assurance / Quality Control Program

Data Quality Objectives	Frequency	Data Quality Indicator
Precision		
Blind duplicates (intra laboratory)	1 / 20 samples	<50 % RPD[1], asbestos in agreement
Blind duplicates (inter laboratory)	1 / 20 samples	<50 % RPD[1], asbestos in agreement
Laboratory duplicates	1 / 20 samples	<50 % RPD[1], asbestos in agreement
Accuracy		
Surrogate spikes	All organic samples	70-130 %
Laboratory control samples	1 per lab batch	70-130 %
Matrix spikes	1 per lab batch	70-130 %
Representativeness		
Sampling appropriate for media and analytes		-[2]
Samples extracted and analysed within holding times.	-	Soil: organics (14 days), inorganics (6 months) Groundwater: metals (6 months, other than mercury - 28 days), sVOCs (>C_{10} - 7 days), volatiles (<C_{10} - 14 days) Soil vapour: sorbent tubes VOCs/TRH (28 days)
Trip spike (soil and groundwater only)	1 per sampling event	70-130 % recovery
Storage blank (soil and groundwater only)	1 per sampling event	<LOR
Rinsate blank (soil and groundwater only)	1 per sampling data where reusable equipment is used	<LOR
Method blank (soil vapour only)	1 per lab batch	<LOR
Trip blank (soil vapour only)		
Laboratory blanks	1 per lab batch	<LOR
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All samples[2]
Standard analytical methods used for all analyses	All Samples	All samples[2]
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples[2]
Limits of reporting appropriate and consistent	All Samples	All samples[2]
Completeness		
Sample description and COCs completed and appropriate	All Samples	All samples[2]
Appropriate documentation	All Samples	All samples[2]
Satisfactory frequency and result for QC samples	All QA/QC samples	-[2]
Data from critical samples is considered valid	-	Critical samples valid[2]
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	All Samples	All samples

[1] If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgment will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

[2] A qualitative assessment of compliance with standard procedures and appropriate sample collection methods will be completed during the DQI compliance assessment.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.2.6 Optimise the Design for Obtaining Data

The validation sampling design is summarised for each specific type of validation works as follows.

8.2.6.1 Validation of Chlorinated Ethenes in Soil and Soil-vapour

Soil Excavation Validation (Vapour)

The required remedial excavation extent will be informed by the VSAQP. Validation of the removal of soils with unacceptable levels of chlorinated ethene soil/soil-vapour concentrations will be conducted in accordance with the procedure presented following. Validation of chlorinated ethene impacted soil removal will require demonstration that residual soils do not result in unacceptable contaminated soil-vapour or leachate generation. Action criteria for soils will be derived within the VSAQP and presented in the relevant RWP(s) and shall be based on site development specific considerations: soil characteristics, backfill characteristics, depth of samples below finished levels, anticipated contaminant transformation/attenuation, rainwater infiltration, etc.

Inspection and sampling of excavations following removal of shallow fill will be required to confirm the absence of residual infrastructure or impacted soils which may result in unacceptable soil vapour concentrations. Where residual impact which may result in unacceptable soil-vapour generation remains (identified via visual/olfactory indicators, field screening or laboratory analysis)), these materials will be further chased out prior to backfill.

Field screening for unacceptable soil-vapour generation potential will be completed in accordance with the following methodology:

- Inspection of residual soils exposed on the excavation surfaces to identify visual or olfactory indicators of residual impact;
- Installation of temporary soil vapour probes or shallow soil vapour wells (per procedure presented in **Section 8.5**);
  - 1 temporary soil vapour probe per 5 m of excavation wall, with a minimum of one per wall; and
  - 1 temporary soil vapour probe per 25 m^2 of excavation base, with a minimum of four per excavation.
- Soil sample locations from the walls of excavations formed by the removal of impacted soils at a frequency of one sampler per 5 m of excavation wall, with a minimum of one per wall and 1 per 25 m^2 from the base of the excavation, with a minimum of four samples.

Installed probes shall be left to equilibrate (30 minutes for spear point or similar probes and 24 hours for soil vapour wells, in accordance with NEPC (2013) requirements) and then soil-vapour samples extracted. Soil vapour samples will be extracted from the temporary probes and analysed (either in field by portable gas-chromatography or by laboratory analysis). Determination of excavation extent acceptability will be made based on comparison of residual soil vapour sample concentrations with action criteria derived in the VSAQP and presented in the relevant RWP(s)**.**

Soil and soil-vapour validation will be analysed for concentrations of TRHs and VOCs. Soil samples will be subjected to ASLP and the resulting leachate fluid analysed for concentrations of CEs to assess the potential for leachate generation. Soil-vapour samples will be compared against site validation criteria (i.e. NEPM 2013 HIL-B and HIL-C, **Section 8.7**) and soil leachate generation compared against groundwater screening criteria (i.e. ANZAST (2018) and NHMRC (2017)). Should exceedance of the screening criteria be identified, further assessment and/or remediation will be required.

Validation of Final Site Surface

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Upon backfilling the remedial excavation and establishment of approximate final site levels, the final site-surface vapour concentrations will require validation. It is anticipated that final site levels will comprise exposed soils/garden beds. On that basis, validation will require to be undertaken by installation of either permanent or temporary soil-vapour wells on an approximate 10 m grid across the remedial excavation footprint. The vapour probes shall be installed to target soils no deeper than 1 m below the final site levels.

A minimum of two rounds of soil-vapour sampling will be conducted per the requirements of the VSAQP. Samples of soil-vapour will be withdrawn from each soil vapour well and submitted for laboratory analysis. Determination of remedial success will be based on comparison of laboratory analytical results with validation criteria presented in the VSAQP and relevant RWP(s).

8.2.6.2 Validation of Petroleum Infrastructure Removal (if required)

Inspection of excavations following removal of petroleum infrastructure will require to be completed to confirm the absence of residual impact which may exceed the NEPC (2013) criteria. Where residual impact which may exceed the NEPC (2013) criteria remain (via visual inspection, olfactory detection and/or through the use of a PID assessment), these materials will be further chased out prior to validation sampling.

Subsequent to the removal of the petroleum infrastructure and associated backfill, validation requirements, consistent with NSW EPA (2014[21]) requirements shall include:

- Sample locations from the walls of excavations formed by the removal of USTs/backfill sands at the frequency of one sample per 5 m of excavation wall per identifiable stratum or 1 m in wall depth, with a minimum of one per wall;
- Sample locations from the base of excavations formed by the removal of USTs at the frequency of one sample per 25 m^2, with a minimum of two per former UST location;
- Discrete sample locations under other petroleum infrastructure (i.e. remote fill points, fuel dispensers). In the event that significant impacted soil volumes are removed from these areas, the adopted sampling frequency for excavation bases and walls following UST removal will be adopted; and
- Sample locations at a linear spacing of 5 m underlying pipelines.

Soil samples shall be analysed for TRHs, PAHs, heavy metals and VOCs and compared against NEPM (2013) site validation criteria **Section 8.7**.

8.2.6.3 Validation of Impacted Fill Management (if required)

Where residual fill impacts are identified (AEC 3 and AEC 4), they are required to be either removed or demonstrated as being suitable to remain on the site under the proposed development scenario (above or below a marker layer). Removal of soils is required to be undertaken to the top of unimpacted fill material, natural soils or a depth of 0.5 m where fill is to be capped *in-situ*.

Subsequent to the removal of impacted fill, validation requirements shall include:

- Sample locations from the walls of excavations formed by the removal of soils at the frequency of one sample per 5 m of excavation wall per identifiable stratum, with a minimum of one per wall; and
- Sample locations from the base of excavations formed by the removal of soils at the frequency of one sample per 25 m^2, with a minimum of one per excavation.

[21] *Technical Note: Investigation of Service Station Sites*. NSW EPA April 2014 (EPA 2014)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.2.6.4 Installation of the Physical Barrier

Where residual contaminated fill, which exceeds criteria for land use but is determined to be suitable for retention under a cap, is required to be retained on site, installation of physical separation arrangements (within road reserves and landscape areas where fill removal is not possible/practicable) shall be defined by survey as completed by a registered surveyor and/or building as-built drawings sufficient to identify:

- The lateral extent and upper depth height of known environmentally impacted materials (i.e. residual fill materials underlying the cover) within each remediation area/stage;
- The lateral extent and type of cover (e.g. permanent pavement, soil thickness) within the remediation area/stage; and
- Confirmation, by photos or otherwise, of the installation of the 'marker layer' underlying the cover (as required).

Physical separation arrangement requirements (i.e. thickness etc.) are detailed in **Section 7.6.6**.

Validation of installation shall demonstrated by inclusion of the following information in the validation report(s):

- Photographic evidence of marker layer application;
- Survey plans including spot measurements of the upper depth of retained contaminated material, the final height of the cap and the lateral extent of the caped area(s); and
- Material characterisation and importation records to demonstrate that capping materials are environmentally suitable for the relevant purposes.

It is anticipated the following materials will be used within the road reserves and across the broader site:

Growing Media

Soils to be imported and used as growing media within the site shall be sampled at a rate of at least one sample per 100 m^3 with a minimum of three samples per source/end location. Samples shall be analysed for TRH, PAHs, heavy metals, (including As, Cd, Cr, Cu, Pb, Hg, Ni and Zn), OCPs, PCBs, asbestos, soil pH and CEC. The materials shall be further inspected for any aesthetic indicators of contamination.

Site sourced natural soils shall be analysed for heavy metals, TRH, VOCs, OCPs, PCBs, pH and CEC. In addition, assessment of the potential presence of aesthetic issues, including staining, discolouration and/or odorous soil conditions will be completed.

Visual inspection is required by the Environmental Consultant during placement to confirm the material is consistent with the material sampled at the source site. Copies of classification certificates and importation records are required to be kept for inclusion in the validation report(s)

VENM

VENM shall be as defined under the *Protection of the Environment Operations (POEO) Act 1997* and characterised by at least five samples per source site and one per 1 000 m^3 being collected if more than 10 000 m^3. Visual inspection is required by the Environmental Consultant at the source site to confirm the material is consistent with the definition of VENM. Copies of VENM certificates and importation records are required to be kept for inclusion in the validation report(s)

ENM

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Sampling and analysis is required to be undertaken as per the exemption (EPA 2014c[22]).

Visual inspection is required by the Environmental Consultant during placement to confirm the material is consistent with the material sampled at the source site. Copies of ENM certificates and importation records are required to be kept for inclusion in the validation report(s)All ENM samples are required to be assessed for the presence of asbestos in addition to the requirements of the ENM analytical suite (EPA 2014c)

Recycled Products

Sampling of materials as per an EPA exemption is required to be undertaken by the facility in accordance with the exemption. In addition, where materials are proposed for beneficial reuse under a NSW EPA exemption (i.e. imported to the site), fill material will need to be further assessed by The Environmental Consultant for land use suitability. Sampling densities and analysis for COPC will be dependent on the volume, material type, source and subject to Site Auditor endorsement. All samples are required to be submitted for analysis of asbestos in addition to other relevant COPCs.

8.2.6.5 Materials Classification for Offsite Disposal

Materials sampled for waste classification in accordance with EPA (2014a) shall be sampled at an appropriate rate to characterise the materials. Stockpiles will be sampled in accordance with NEPC (2013). If the stockpile is greater than 200 m^3 the sampling rate shall be determined by the Field Scientist on the basis of the volume of materials and any potential heterogeneity occurring within the materials.

Sampling of materials as per the ENM exemption (or similar) requires to be undertaken in accordance with the exemption.

Sampling of site materials as per a VENM classification will require the collection of at least 10 samples with one per 1 000 m^3 being collected if more than 10 000 m^3 has been removed.

Sampling of materials as per an EPA exemption is required to be undertaken by the receiving facility in accordance with the exemption. In addition, where materials are proposed for beneficial reuse under a NSW EPA exemption (i.e. imported to the site), fill material will need to be further assessed by The Environmental Consultant for land use suitability. Sampling densities and analysis for COPC will be dependent on the volume, material type, source and subject to Site Auditor endorsement.

8.2.6.6 Confirmation of Hydrocarbon Removal from Soils

All petroleum hydrocarbon impacted soils to be treated on site (refer to **Section 7.6.5**), will be sampled at a density of one sample per 70 m^3 (minimum three samples per stockpile) and submitted for relevant COPCs (**Table 8.2**).

The successful treatment of CE impacted materials will be informed by field screening of soil vapour levels within treated stockpiles. A temporary soil vapour probe will be driven 1 m into discrete stockpiles of material with a maximum volume of 50 m^3. A soil vapour sample will be withdrawn from the stockpile after an equilibration period of 30 minutes, and assessed either in the field by portable gas-chromatography or by laboratory analysis. Specific action criteria for CE impacted stockpile remediation will be derived in the VSAQP and presented in the relevant RWP(s).

Where soil-vapour criteria have been satisfied, the stockpiles will be sampled and analysed for the presence of soil-bound CEs. A minimum of three soil samples are required to be collected from at least 200 mm below the stockpile surface. If detections of soil-bound CEs are identified, subsequent leachate analysis will be conducted to determine whether the CEs present a potential groundwater

[22] *The Excavated Natural Material Order 2014*. NSW EPA dated 24 November 2014, NSW EPA 2014b

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

migration risk. Determination of suitability to be retained on site will be made by comparison of leachate data against criteria presented in **Section 8.7** (i.e. ANZAST (2018) and NHMRC (2017)).

8.2.6.7 Validation of Groundwater Impact Attenuation

At the commencement of soil remediation at 134-138 and 140 Henry Street, concentrations of VOCs in groundwater shall be monitored via groundwater monitoring events conducted on offsite wells existing (JBMW01, JMBW02, JBMW03, JBMW05, JBMW06 and JBMW07) biannually. Monitoring of offsite groundwater VOC concentrations will continue for a minimum of four sampling events or until stable/decreasing concentrations are determined by a statistical assessment using the Mann-Kendall test).

Groundwater validation samples will be assessed to the ANZAST (2018) and NHMRC (2017) validation criteria.

8.2.6.8 Validation of Groundwater Offsite Migration Risk

Sufficient assessment will be required to demonstrate that offsite groundwater impacts do not present an unacceptable risk to downgradient receptors. This may comprise risk based determination that identified concentrations do not represent an unacceptable risk at the receiving water body and/or nearby building basements or complete delineation of the CE plume.

As a minimum, confirmation of the groundwater flow direction and review of groundwater concentrations following validation of groundwater impact attenuation (**Section 8.2.6.7**). Further installation and sampling of groundwater monitoring wells may be required as part of this works, the details of which shall be confirmed following detailed development designs and included in future RWP(s).

8.2.6.9 Sampling Frequency

Table 8.2 summarises the required validation sampling frequencies

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 8.2 Validation Sample Analytical Frequencies

Purpose	Media	Frequency	Analytes
Validate Removal of Impact Source			
Chlorinated Ethene Impacted Soil Excavation Validation	Soil Vapour	**Field Screening (GC-PID) or Laboratory Analysis** 1 / 5 m of excavation wall minimum of 1 / wall; and 1 / 25 m^2 of base minimum of 1 / excavation.	**Screening** PCE/TCE concentrations by GC-PID **Laboratory Analysis** VOCs (USEPA 8260)
	Soil / Soil Leachate	**Laboratory Analysis** 1 / 5 m of excavation wall minimum of 1 / wall; and 1 / 25 m^2 of base minimum of 1 / excavation.	**Laboratory Analysis** VOCs (LTM-ORG-2103) ASLP (LTM-GEN-7010)
Validation of Final Site Surfaces for CEs in Soil Vapour	Soil Vapour	**2 Rounds - Laboratory Analysis** 1 / 5 m of excavation wall minimum of 1 / wall; and 1 / 25 m^2 of base minimum of 1 / excavation.	**Laboratory Analysis** VOCs (USEPA 8260)
Petroleum Infrastructure and Impacted Soil Remedial Excavations Validation	Soil	**Laboratory Analysis** 1 / 5 m wall / stratum / metre depth 1 / 25 m^2 base 1 / 5 m underlying service lines.	TRHs (LTM-ORG-2010) Heavy metals (LTM-MET-3040) PAHs (LTM-ORG-2130) VOCs (LTM-ORG-2150)
Impacted Fill Excavation Validation	Soil	**Laboratory Analysis** 1 / 5 m wall / stratum / metre depth 1 / 25 m^2 base	Relevant COPCs and appropriate NATA accredited laboratory methodology

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Purpose	Media	Frequency	Analytes
Importation / Exportation of Soils			
Classification for Offsite Disposal	Soil	**Laboratory Analysis** 1 / 25 m^3 minimum 3 samples per material type	Heavy metals (LTM-MET-3040) TRHs and BTEX (LTM-ORG-2010) PAHs (LTM-ORG-2130) OCPs and PCBs (LTM-ORG-2220) Asbestos (AS4964-2004) VOCs (LTM-ORG-2150)
Classification for Importation to Site	Soil	**Laboratory Analysis** **VENM** 5 samples and an addition 1/1000 m^3 for volumes exceeding 10 000 m^3 **Growing Media** 1 / 100 m^3 and minimum 3 samples **ENM and Recycled Products** In accordance with relevant EPA guidance	**VENM** Heavy metals (LTM-MET-3040) TRHs and BTEX (LTM-ORG-2010) PAHs (LTM-ORG-2130) OCPs and PCBs (LTM-ORG-2220) Asbestos (AS4964-2004) **Growing Media** Heavy metals (LTM-MET-3040) TRHs (LTM-ORG-2010) PAHs (LTM-ORG-2130) OCPs and PCBs (LTM-ORG-2220) VOCs (LTM-ORG-2150) Asbestos (AS4964-2004) pH (LTM-GEN-7090) CEC (LTM-GEN-7080) **ENM and Recycled Products** In accordance with relevant EPA guidance with asbestos analysis (AS4964-2004)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Purpose	Media	Frequency	Analytes
Validation of Stockpiled Soil Treatment			
Validation of Chlorinated Ethene Removal from Soils	Soil-Vapour	**Field Screening (GC-PID) or Laboratory Analysis** 1 / stockpile (max volume 50 m^3)	**Screening** PCE/TCE concentrations by GC-PID **Laboratory Analysis** VOCs (USEPA 8260)
	Soil / Soil Leachate	3 / stockpile (maximum volume 50 m^3)	**Laboratory Analysis** VOCs (LTM-ORG-2103) ASLP (LTM-GEN-7010)
Validation of Petroleum Hydrocarbon Removal from Soils	Soil	1 / 70 m^3 and minimum 3 samples per stockpile	TRHs (LTM-ORG-2010) Heavy metals (LTM-MET-3040) PAHs (LTM-ORG-2130) VOCs (LTM-ORG-2150)
Validation of Groundwater and Soil Vapour Impact Attenuation	Groundwater and Soil Vapour	Minimum 4 monitoring rounds on 6 wells	VOCs (LTM-ORG-2150) Dissolved gases (LTM-ORG-2070) Chloride (LTM-INO-4090) Ferrous Iron (LTM-INO-4190) Nitrate (APHA 4500 NO3) pH (LTM-GEN-7090) Sulphate (LTM-INO-4110) Organic Carbon (APHA 5310B) Alkalinity (APHA 2320)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.3 Soil Sampling Methodology

The soil sampling method shall be determined by the Field Scientist as consistent with the observations of the site sub-surface and appropriate to generate representative samples. The soil sampling method shall be consistent with the data quality indicators in **Section 8.2.5**.

Where sample locations are placed by boreholes, undisturbed samples, as collected by push tube or SPT sampler, are preferred where able to be effectively implemented. Otherwise samples may be recovered from solid flight augers or via use of an excavator/hand tools. Re-usable equipment shall require to be decontaminated between sampling locations.

8.3.1 Soil Sample Containers

During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indications of contamination shall be noted on field reporting sheets/field logs.

Collected soil samples shall be immediately transferred to sample containers of appropriate composition (glass jars) fitted with Teflon sealed lids. 500 mL samples shall be additionally collected and placed in new zip lock bags where asbestos analysis is required. Sample labels shall record sample identification number and date and time of sampling. Sample containers shall be transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form shall be completed and forwarded with the samples to the testing laboratory, containing the following information:

- Sample identification;
- Signature of sampler;
- Date of collection;
- Type of sample;
- Number and type of container;
- Inclusive dates of possession; and
- Signature of receiver.

8.3.2 PID Screening

Soil samples will be screened during field works using a PID to assess the potential presence of VOCs including petroleum hydrocarbons. Samples obtained for PID screening will be placed in a sealed plastic bag for approximately 5 minutes to equilibrate, prior to a PID being attached to the bag. Readings will then be monitored for a period of approximately 30 seconds or until values stabilise and the stable/highest reading will be recorded on the field sample forms. The PID will be calibrated prior to the commencement of field works and then check readings will be completed on a daily basis during the field program using suitable calibration gas. If required, the PID will be re-calibrated during the field program in accordance with manufacturer's instructions.

A GC-PID will be used to analyse gas samples on the site for concentrations of specific CEs. The GC-PID will be calibrated against gas standards and will offer real time screening of soil-vapour impacts to assist in advancement of the remedial excavation. The specific action criteria for PID screening shall be detailed in a Vapour Validation Sampling, Analysis and Quality Plan (VSAQP) issued prior to or as part of the stage specific RWPs or separately to the site auditor.

8.4 Groundwater Sampling Methodology

Groundwater wells will be inspected prior to sampling to ascertain their condition and determine whether they're suitable for sampling. If the presence of excessive sediment is identified the wells should be purged and allowed to settle for a minimum of 5 days prior to sampling.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Each monitoring well will be gauged with an Interface Probe (IP) which can detect NAPLs. The groundwater at each well will then be purged with a QED low flow/micropurge submersible bladder pump, using fresh disposable bladders and low-density polyethylene tubing, to remove the standing water. During removal, physiochemical parameters (pH, electrical conductivity, dissolved oxygen, reduction-oxidation potential and temperature) will be monitored until stabilisation, consistent with the requirements of VIC EPA (2000[23]). Groundwater samples will be taken from the end of the disposable LDPE tubing after parameter stabilisation has occurred.

Collected groundwater samples will be immediately filtered (as necessary) and transferred to laboratory supplied sample bottles. The sample containers will be transferred to a chilled iced box for sample preservation prior to and during shipment to the testing laboratory. A chain of custody form will be completed and forwarded with the samples. Samples will be analysed in accordance with the laboratory schedule (**Table 7.3**).

8.5 Soil-vapour Assessment

8.5.1 Temporary Soil Vapour Probe and Soil Vapour Well Installation

Temporary probes and soil-vapour wells are required to be installed to a minimum depth, or penetration if installed into excavation walls, of 1.0 m.

Temporary Soil Vapour Probes

temporary soil vapour probe will be directly driven into the face of exposed soils at the excavation base or walls to the required penetration depth, either by hand or mechanically assisted, and allowed to sit for a minimum of 30 minutes prior to sampling. The probes may be withdrawn and reused subject to appropriate decontamination.

Stockpiles requiring soil-vapour assay will be assessed via spear probes.

Soil Vapour Wells

Where soil-vapour wells are to be used, boreholes will be advanced via hand auger or drill rig. 6 mm nylon tubing with a stainless steel tip will be installed to the depth of the borehole, which will then be backfilled with graded sand adjoining the base of the sample tube, overlain by a nominal thickness of powdered bentonite, and backfilled with grout/bentonite chips to create an air-tight seal at the surface. Soil-vapour wills will be left to equilibrate for a period of 24 hours prior to sampling.

8.5.2 Soil-vapour Sampling

PID screening will be utilised to screen for residual volatile impacts within remedial excavations and treated soils. Samples will be obtained via installation of temporary 'spear probes' or soil-vapour wells. Once the probes/wells have equilibrated for the required period (30 minutes for spear probes and 24 hours for vapour wells), the PID will be attached to sample tubing for a period of approximately 30 seconds or until values stabilise and the stable/highest reading will be recorded on the field sample forms.

Soil-vapour will be sampled in accordance with the following methodology:

- A multi-gas meter will then be used to purge each probe for a period of at least 5 mins. Gas readings will be monitored until oxygen and PID readings stabilise;
- Following this a leak detection evaluation will be completed via placement of an isopropyl alcohol-soaked rag over the top of the backfilled borehole to assess the potential occurrence of leaks whilst the gas detector is purging the sample point. Elevated PID readings on the

[23] *Groundwater Sampling Guidelines*. Victoria Environment Protection Authority, April 2000, VIC EPA (2000);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

gas detector will indicate a leaking probe. Any leaking probes will be required to be reinstalled and re-checked prior to sampling using the same method;

- Attach via use of silicon a carbon tube to the exposed temporary soil vapour probe tubing;
- Attach a calibrated low-flow pump (<0.2 L/min) to the carbon tube using additional section of 6mm Teflon tubing as required;
- Withdraw sufficient soil gas over the carbon tube to ensure required detection limits are met for relevant COPCs and submit tubes for analysis as per **Section 8.7**.

8.6 Laboratory Analysis

NATA accredited laboratories shall be used for all analysis of samples. Appropriate methods and LORs are required for comparison to relevant criteria. Laboratory methods and LORs are presented in **Table 8.2** below.

Table 8.3: Soil Laboratory Analysis Methods (all units in mg/kg)

Analyte	Limit of Reporting	Laboratory Method
Metals		
Arsenic	2.0	LTM-MET-3040_R0
Cadmium	0.4	LTM-MET-3040_R0
Chromium (total)	5.0	LTM-MET-3040_R0
Copper	5.0	LTM-MET-3040_R0
Lead	5.0	LTM-MET-3040_R0
Nickel	5.0	LTM-MET-3040_R0
Zinc	5.0	LTM-MET-3040_R0
Mercury (inorganic)	0.1	LTM-MET-3040_R0
TRH		
$C_6 – C_9$ Fraction	20	TRH C6-C36 - LTM-ORG-2010
$C_{10} – C_{14}$ Fraction	20	TRH C6-C36 - LTM-ORG-2010
$C_{15} – C_{28}$ Fraction	50	TRH C6-C36 - LTM-ORG-2010
$C_{29} – C_{36}$ Fraction	50	TRH C6-C36 - LTM-ORG-2010
BTEX		
Benzene	1.0	TRH C6-C40 - LTM-ORG-2010
Toluene	1.0	TRH C6-C40 - LTM-ORG-2010
Ethylbenzene	1.0	TRH C6-C40 - LTM-ORG-2010
Total Xylenes	3.0	TRH C6-C40 - LTM-ORG-2010
PAHs		
Benzo(a)pyrene	0.5	LTM-ORG-2130
Total PAHs	0.5	LTM-ORG-2130
PCBs		
PCBs (total)	0.1	LTM-ORG-2220
OCPs		
Aldrin + Dieldrin	0.05	LTM-ORG-2220
Chlordane	0.1	LTM-ORG-2220
DDT + DDD + DDE	0.05	LTM-ORG-2220
Endosulfan	0.05	LTM-ORG-2220
Endrin	0.05	LTM-ORG-2220
Heptachlor	0.05	LTM-ORG-2220
Hexachlorobenzene	0.05	LTM-ORG-2220
Methoxychlor	0.05	LTM-ORG-2220
Mirex	0.05	LTM-ORG-2220
Toxaphene	0.05	LTM-ORG-2220
VOCs		
PCE	0.5	LTM-ORG-2150 VOCs
TCE	0.5	LTM-ORG-2150 VOCs
Cis 1,2 DCE	0.5	LTM-ORG-2150 VOCs
Trans 1,2 DCE	0.5	LTM-ORG-2150 VOCs
VC	0.5	LTM-ORG-2150 VOCs
Other		

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Analyte	Limit of Reporting	Laboratory Method
Asbestos	Presence / 0.001 % w/w	PLM / Dispersion Staining as per AS4964:2004
Soil pH	0.1	5:1 leach

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 8.4: Groundwater Laboratory Analysis Methods (all units in mg/L)

Analyte	Limit of Reporting	Laboratory Method
Metals		
Arsenic	0.001	LTM-MET-3040
Cadmium	0.0002	LTM-MET-3040
Chromium (total)	0.001	LTM-MET-3040
Copper	0.001	LTM-MET-3040
Lead	0.001	LTM-MET-3040
Nickel	0.001	LTM-MET-3040
Zinc	0.005	LTM-MET-3040
Mercury (inorganic)	0.0001	LTM-MET-3040
TRH		
$C_6 – C_9$ Fraction	0.02	TRH C6-C36 - LTM-ORG-2010
$C_{10} – C_{14}$ Fraction	0.05	TRH C6-C36 - LTM-ORG-2010
$C_{15} – C_{28}$ Fraction	0.1	TRH C6-C36 - LTM-ORG-2010
$C_{29} – C_{36}$ Fraction	0.1	TRH C6-C36 - LTM-ORG-2010
BTEX		
Benzene	0.001	TRH C6-C40 - LTM-ORG-2010
Toluene	0.001	TRH C6-C40 - LTM-ORG-2010
Ethylbenzene	0.001	TRH C6-C40 - LTM-ORG-2010
Total Xylenes	0.003	TRH C6-C40 - LTM-ORG-2010
PAHs		
Benzo(a)pyrene	0.00001	LTM-ORG-2130
Total PAHs	0.00001	LTM-ORG-2130
VOCs		
PCE	0.001	LTM-ORG-2150 VOCs
TCE	0.001	LTM-ORG-2150 VOCs
Cis 1,2 DCE	0.001	LTM-ORG-2150 VOCs
Trans 1,2 DCE	0.001	LTM-ORG-2150 VOCs
VC	0.001	LTM-ORG-2150 VOCs

Table 8.5: Soil-vapour Laboratory Analysis Methods (all units stated in mg assuming sample volume of >25 L)

Analyte	Limit of Reporting	Laboratory Method
TRH		
$C_6 – C_9$ Fraction	0.01	TRH C6-C36 - LTM-ORG-2010
BTEX		
Benzene	0.0005	LTM-ORG-2150 VOCs
Toluene	0.0005	LTM-ORG-2150 VOCs
Ethylbenzene	0.0005	LTM-ORG-2150 VOCs
Total Xylenes	0.0005	LTM-ORG-2150 VOCs
VOCs		
PCE	0.0005	LTM-ORG-2150 VOCs
TCE	0.0005	LTM-ORG-2150 VOCs
Cis 1,2 DCE	0.0005	LTM-ORG-2150 VOCs
Trans 1,2 DCE	0.0005	LTM-ORG-2150 VOCs
VC	0.0005	LTM-ORG-2150 VOCs

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.7 Validation Criteria

Determination that remediation of the site has been achieved will be completed in accordance with the validation criteria set below. Based on the proposed development details, in accordance with the decision process for assessment of urban redevelopment sites (EPA 2017) concentrations of contaminants in media shall be compared against relevant criteria presented in **Tables 8.6, 8.7** and **8.8** sourced from the regulatory guidance listed below.:

In addition to site media contaminant concentrations, the Environmental Consultant will require to consider the circumstances which would trigger an assessment of aesthetics in accordance with NEPC (2013) throughout remediation. Where the triggers are satisfied, aesthetic issues which trigger the requirement for assessment shall be considered by the Environmental Consultant and any further remediation/management requirements identified to the Remediation Contractor

Soil Validation Criteria

- Health based Investigation Levels (HILs) for residential with limited access to soils (HIL-B), recreational and public open space (HIL-C) and commercial/industrial land use (HIL-D) – NEPC (2013);
- Health Screening Levels (HSLs), both fine and coarse-grained soils, for petroleum hydrocarbons considering potential for vapour intrusion – NEPC (2013);
- As a conservative measure, generic and site specific ecological investigation levels (EILs) were derived through the added contaminant limits;
- Management Limits for TRH, both fine and coarse-grained soils, for residential/public open space and commercial/industrial land use – NEPC (2013); and
- Ecological Screening Levels (ESLs) for TRH fractions, BTEX and benzo(a)pyrene, both fine and coarse-grained soil, for residential/public open space and commercial/industrial land uses – (NEPC 2013);

Groundwater/Leachate Criteria

- Recreational Health and aesthetics-based criteria adopted from the *Australian Drinking Water Guidelines* – NHMRC (2017);
- Groundwater HSLs, both fine and coarse-grained soils for petroleum hydrocarbons considering potential for vapour intrusion – NEPC (2013); and
- 95 % protection of freshwater aquatic ecosystems from the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* – ANZAST (2018);

Soil-vapour Criteria

- Interim Soil-vapour Health Investigation Levels for Volatile Organic Chlorinated Compounds – NEPC (2013); and
- Soil Vapour HSLs for Vapour Intrusion – NEPC (2013).

Where there are no NSW EPA endorsed thresholds the laboratory LOR has been adopted as an initial screening value for the purposes of this assessment.

The specific requirements for this assessment shall be detailed in a the VVSAQP, either included within the stage specific RWPs or to be issued separately, to the Site Auditor subsequent to delineation of soil-vapour impact. The RWPs/VVSAQP will include PID action criteria to guide field screening assessment

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 8.6 Health Based Soil Investigation Criteria and Hydrocarbon Management Limits (all units in mg/kg)

	Health Investigation Levels			Health Screening Levels[6]			Management Limits[5]	
	HIL-B	HIL-C	HIL-D	HSL-B	HSL-C	HSL-D	Urban Residential, Parkland and Public Open Space	Commercial Industrial
Metals								
Arsenic	500	300	3000	-	-	-	-	-
Cadmium	150	90	900	-	-	-	-	-
Chromium(VI)	150[1]	300[1]	3600[1]	-	-	-	-	-
Copper	30 000	17 000	240 000	-	-	-	-	-
Nickel	1200	1200	6000	-	-	-	-	-
Lead	1200	600	1500	-	-	-	-	-
Zinc	60 000	30 000	400 000	-	-	-	-	-
Mercury (inorganic)	120[2]	80[2]	730[2]	-	-	-	-	-
PAHs								
Carcinogenic PAHs (as B(a)P TEQ)[3]	4	3	40	-	-	-	-	-
Total PAHs[4]	400	300	4000	-	-	-	-	-
BTEX								
Benzene	-	-	-	0.5	NL	3	-	-
Toluene	-	-	-	160	NL	NL	-	-
Ethylbenzene	-	-	-	55	NL	NL	-	-
Total Xylenes	-	-	-	40	NL	NL	-	-
Naphthalene	-	-	-	3	NL	NL	-	-
TRH								
F1 C_6-C_{10}	-	-	-	45 [6,7]	NL[6,7]	260 [6,7]	700	700
F2 >C_{10}-C_{16}	-	-	-	110 [6]	NL[6]	NL	1000	1000
F3 >C_{16}-C_{34}	-	-	-	-	-	-	2500	3500
F4 >C_{34}-C_{40}	-	-	-	-	-	-	10 000	10 000
OCPs								
DDT + DDD + DDE	600	400	3600	-	-	-	-	-
Aldrin + Dieldrin	10	10	45	-	-	-	-	-
Chlordane	90	70	530	-	-	-	-	-
Endosulfan	400	340	2000	-	-	-	-	-
Endrin	20	20	100	-	-	-	-	-
Heptachlor	10	10	50	-	-	-	-	-

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

	Health Investigation Levels			Health Screening Levels[6]			Management Limits[5]	
	HIL-B	HIL-C	HIL-D	HSL-B	HSL-C	HSL-D	Urban Residential, Parkland and Public Open Space	Commercial Industrial
HCB	15	10	80	-	-	-	-	-
Methoxychlor	500	400	2500	-	-	-	-	-
Mirex	20	20	100	-	-	-	-	-
Toxaphene	30	30	160	-	-	-	-	-
PCBs								
Total PCBs	1	1	7	-	-	-	-	-
OTHER								
Asbestos (surface soils)	No visible asbestos	No visible asbestos	No visible asbestos	-	-	-	-	-
Bonded Asbestos (top 0.5 m)	0.04 %	0.02 %	0.05 %	-	-	-	-	-
Asbestos (below 0.5 m)	0.001 %	0.001 %	0.001 %	-	-	-	-	-

Notes:

[1.] Guideline values presented are for Chromium (VI) in absence of total Chromium values. Where total Chromium results are elevated, samples will be analysed for Chromium (VI).

[2.] Guideline values are for inorganic mercury. Where elevated mercury concentrations are encountered and/or site information suggests the potential presence of elemental mercury and/or methyl mercury, consideration of applicability would be needed.

[3.] Carcinogenic PAHs calculated as per Benzo(a)pyrene Toxicity Equivalent Factor requirements presented in NEPC (2013)

[4.] Total PAHs calculated as per requirements presented in NEPC (2013).

[5.] Management Limits are based on coarse grained soil, with F1 and F2 concentrations inclusive of naphthalene and BTEX compounds. Management limits will only apply where long-term containment of impacted material is proposed.

[6.] Soil Health Screening Levels for Vapour Intrusion: Coarse Soils. Values presented are those for 0 to <1 m bgl as the most conservative level. Reference should be made to results tables for further detail of levels at greater depths. NL: Non-limiting.

[7.] Values for F1 C_6-C_9 are obtained by subtracting BTEX (Sum) from laboratory result for C_6-C_9 TRH.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 8.7 Ecological Investigation and Ecological Screening Levels (all units in mg/kg)

	Ecological Investigation Levels [1]		Ecological Screening Levels [2]	
	Urban Residential/Public Open Space	Commercial/Industrial	Urban Residential/Public Open Space	Commercial/Industrial
Metals				
Arsenic	100	160	-	-
Chromium(III)	412 [3]	672 [3]	-	-
Copper	179	239	-	-
Nickel	176	296	-	-
Lead	1403	2103	-	-
Zinc	412	562	-	-
PAHs				
BaP[3]	-	-	0.7	0.7
BTEX				
Benzene	-	-	50	75
Toluene	-	-	85	135
Ethylbenzene	-	-	70	165
Total Xylenes	-	-	105	180
Naphthalene	170	370	-	-
TRH				
F1 C_6-C_{10}	-	-	180 [4]	215 [4]
F2 >C_{10}-C_{16}	-	-	120 [4]	170 [4]
F3 >C_{16}-C_{34}	-	-	300	3300
F4 >C_{34}-C_{40}	-	-	2800	6600
OCPs				
DDT	180	640	-	-
VOCs				
PCE	0.5 [5]	0.5 [5]	-	-
TCE	0.5 [5]	0.5 [5]	-	-
Cis 1,2 DCE	0.5 [5]	0.5 [5]	-	-
Trans 1,2 DCE	0.5 [5]	0.5 [5]	-	-
VC	0.5 [5]	0.5 [5]	-	-

Notes:

1. EILs calculated based on site specific data obtained from JBS&G (2017): CEC 15.75 meq/100g, pH 7.3 and % Clay 35 %.
2. ESLs based on coarse grained soils, with F1 and F2 concentrations inclusive of naphthalene and BTEX compounds.
3. Chromium values presented for chromium (III).
4. Values for F1 C_6-C_9 are obtained by subtracting BTEX (Sum) from laboratory result for C_6-C_9 TRH.
5. No EPA endorsed criteria for total soil concentrations are provided. The laboratory LOR will be used for initial screening, and where detections are reported, the soils will be subject to leachate assessment to determine whether soil-bound VOCs represent a potential groundwater migration risk. Leachate results will be assessed against groundwater assessment criteria.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 8.8 Soil-vapour Health Investigation and Screening Levels (all units in mg/m³)

	Health Investigation Levels			Health Screening Levels		
	HIL-B	HIL-C	HSL-D	Low and High Density Residential	Recreational / Public Open Space	Commercial / Industrial
VOCs						
PCE	2	40	8	-	-	
1,1,1-TCA	60	1200	230	-	-	
TCE	0.02	0.4	0.08	-	-	
Cis 1,2 DCE	0.08	2	0.3	-	-	
VC	0.03	0.5	0.31	-	-	
BTEX						
Benzene	-	-	-	1	360	4
Toluene	-	-	-	1300	NL	4800
Ethylbenzene	-	-	-	330	NL	1300
Total Xylenes	-	-	-	220	NL	840
Naphthalene	-	-	-	0.8	410	3
Petroleum Hydrocarbons						
F1 C_6-C_{10}	-	-	-	180	86 000	680
F2 >C_{10}-C_{16}	-	-	-	130	NL	500

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 8.9 Groundwater and Soil Screening Validation Criteria (all units in µg/L)

Analyte	ANZAST (2018) 95 % Species Protection	NHMRC (2017) Recreational	NEPC (2013) HSLs (High Density Residential)
Heavy Metals			
Arsenic	13	100	-
Cadmium	0.2	20	-
Chromium	1	-	-
Copper	1.4	20 000	-
Lead	3.4	100	-
Mercury	0.6	10	-
Nickel	11	200	-
Zinc	8	-	-
TRHs			
F1	-	-	NL
F2	-	-	NL
BTEX			
Benzene	950	-	5000
Toluene	-	-	NL
Ethylbenzene	-	-	NL
Xylene	550	-	NL
PAHs			
Benzo(a)pyrene	-	0.1	-
VOCs			
PCE	70	500	-
TCE	330	200	-
Cis 1,2 DCE	-	360[1]	-
VC	-	3	-

Notes:

[1.] Construction/recreational exposure screening criterion adopted from Region 9 RSLs US EPA (2018)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.7.1 Application of Soil Assessment Criteria

For soils proposed to be retained *in-situ* they are required to meet soil validation criteria. Soil validation criteria will apply to all soils proposed to be left at the site. The specific criteria for soils will depend on the ultimate placement location (within the proposed park, publicly accessible areas or within the high-density residential/commercial precinct) and whether any separation is proposed (above or below the marker layer) as per the following. It is noted that the following criteria are based on the anticipated site uses, where ground floor residential and/or sensitive commercial land uses (childcare centres) are proposed, more stringent soil assessment criteria may be required and should be stipulated in the relevant RWP(s).

- Soils validated *in-situ* or placed within the proposed park / green spaces are to be assessed against HIL/HSL-C, ecological and management limit validation criteria for recreational / public open space land uses;
- Soils validated *in-situ* or placed within the future commercial / residential precinct are to be assessed against HIL/HSL-D, ecological and management limit validation criteria for residential and commercial/industrial land uses.

Where elevated concentrations (exceeding investigation/screening levels presented in **Table 8.6** and **8.6**) of potentially leachable and/or volatile contaminants are identified, either further remediation of soils will be undertaken or subsequent assessment of for potential groundwater and soil-vapour generation is required:

- Elevated concentrations of potentially leachable contaminants in soils: samples with the highest reported concentrations are required to be submitted for Australian Standard Leachate Procedure (ASLP) and the resulting leachate analysed for concentrations of the identified contaminants. Leachate results will be screened against groundwater assessment criteria; and
- Elevated concentrations of volatile contaminants in soils: soil-vapour assessment is required to be completed on the residual soils in accordance with the methodology discussed in **Section 8.3.2**.

Where impacted soils are retained under a cap/cover, they are required to be assessed for potential groundwater and soil-vapour generation per the above procedure.

<u>Statistical Assessment</u>

For soils to be considered as having met the assessment criteria (i.e., not posing an unacceptable risk), the following assessment will be made:

Either:

- All contaminant concentrations were less than the adopted site assessment criteria,

Or:

- The upper 95 % confidence limit on the average concentration for each analyte (calculated for samples collected from consistent soil horizons, stratigraphy or material types) was below the adopted criterion;
- No single analyte concentration exceeded 250 % of the adopted criterion; and
- The standard deviation of the results was less than 50 % of the criterion.

In addition to the numerical criteria, the following visual observations will also supplemented the assessment process:

- No visible asbestos containing material in addition to laboratory analysis results; and

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Consideration was given to odorous or discoloured soils (caused by contamination).

8.7.2 Material Characterisation for Off-site Disposal

Where contaminated fill/soil is not suitable for onsite management or is surplus to construction requirements, materials are proposed to be remediated by off-site removal and disposal. Materials shall be classified in accordance with EPA (2014) *Waste Classification Guidelines* or an appropriate exemption as created under the *Protection of the Environment Operations (Waste) Regulation 2014*.

Given the identification of ash and slag inclusions in fill material samples with elevated total PAH and metal concentrations, the ash and slag inclusions are concluded to be a significant source of these contaminants. On this basis, it is appropriate to apply the associated NSW EPA general immobilisation approvals (EPA 1999[24] and EPA 2009[25]) when consideration is given to evaluating a waste classification(s) for material required to be excavated during the remedial works.

Material will require to be removed to a facility lawfully able to receive it.

8.7.3 Imported Materials

In accordance with current EPA policy, only material that does not represent an environmental or health risk at the receiving site may be considered for resource recovery. Imported materials will only be accepted to the site if they meet the restrictions placed on these materials and meet the definition of:

- Virgin Excavated Natural Material (VENM) as defined in the *Protection of the Environment Operations Act* (1997) Schedule 1;
- Excavated Natural Material (ENM) as defined in EPA (2014); or
- Recycled materials as per an EPA exemption.

All materials imported onto the site are required to be accompanied by appropriate documentation that has been verified by the appointed site contamination (environmental) consultant.

Sampling of materials as per an EPA exemption (recycled products) is required to be undertaken by the facility in accordance with the exemption. In addition, where materials are proposed for beneficial reuse under a NSW EPA exemption (i.e. imported to the site), fill material will need to be further assessed by The Environmental Consultant for land use suitability. Sampling densities and analysis for COPC will be dependent on the volume, material type, source and subject to Site Auditor endorsement.

8.7.4 Validation of Soil Placement Areas

Soils which are to be moved to another area of the site will be subject to the following data recording process for future reference purposes, and detailed in the MTP:

- A location plan of the placed materials with co-ordinates based on an agreed grid system (e.g., GPS or relative to the lot boundaries);
- The levels in m AHD of the base of the placement location(s) prior to the material placement;
- The levels in m AHD of the placement locations once all materials have been placed;
- The levels in m AHD of any defining layers; and

[24] *General Approval of the Immobilisation of Contaminants in Waste – Ash and Coal*. EPA 1999
[25] *General Approval of the Immobilisation of Contaminants in Waste – Metalurgical Furnace Slag*. EPA 2009

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Subsequently the total placed volume of materials.

8.7.5 Validation of Physical Separation

Qualitative review of documentation pertaining to the physical separation arrangements employed at the site will be undertaken to determine suitability for the intended purpose. Documentation will require to demonstrate, at minimum, the items identified in **Section 8.2.6.5.**

8.8 Reporting

At the completion of site remediation works, a validation report will be prepared in general accordance with EPA (2017) and OEH (2011) *Guidelines for Consultants Reporting on Contaminated Site*, documenting the works as completed.

This report will contain information including:

- Details of the area of the site which is subject to the validation assessment;
- Details of the remediation works conducted;
- Information demonstrating that the objectives of this RAP have been achieved, in particular the validation sample results and assessment of the data against both the pre-defined DQO and the remediation acceptance (validation) criteria;
- Clear statement that the remedial/validation works have been completed in accordance with the requirements of the RWP(s) and VSAQP;
- Information demonstrating compliance with appropriate regulations and guidelines;
- Any variations to the strategy undertaken during the implementation of the remedial works;
- Results of all environmental monitoring undertaken during the course of the remedial works;
- Details of any environmental incidents occurring during the course of the remedial works and the actions undertaken in response to these incidents;
- Verification of regulatory compliance;
- Details on waste classification, tracking and off-site disposal including landfill dockets;
- Clear statement of the suitability of the portion of the site which is the subject of the validation report, for the proposed use(s);
- Material tracking records which demonstrate that materials imported onsite and dispose offsite have been moved in accordance with relevant regulatory requirements; and
- Other information as appropriate, including details of EMPs (if required) that will apply to the part of the site that is the subject of the validation report.

The report will serve to document the remediation works for future reference.

Given the anticipated staged nature of site remediation, reporting, including preparation of RWP(s), EMP(s) and validation report(s) will also be staged.

8.9 Environmental Management Plan

Should validation of the site, or part thereof, identify that impacted material will remain upon completion of the works, collected data will be assessed in relation to the potential for implementation of an EMP for ongoing management of contamination risks. As per the DQO decision rule processes discussed in **Section 8**, the presence of soil impacted by contaminants of concern above the site criteria may trigger the requirement for an ongoing EMP.

Where required, the EMP shall contain the following elements:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- A statement of the objectives of the EMP – i.e., to ensure continued suitability of the site after it has been remediated;
- Identification of residual environmental contamination issues at the site that require ongoing management/monitoring to meet the EMP objectives, including the type of contamination and location within the site (including survey plans);
- Documentation of environmental management measures which have been implemented to address the identified environmental issues at within the site;
- Description of management controls to limit the exposure of the site users to known areas of contamination to acceptable levels;
- Description of responsibilities for implementing various elements of the provisions contained in the EMP;
- Timeframes for implementing the various control/monitoring, etc. elements outlined in the EMP;
- Environmental monitoring and reporting requirements (if required) for the future management of environmental impact underlying the site including:
    - Appropriate monitoring locations and depth within and down-gradient of any residual contamination;
    - Relevant assessment criteria to be used in evaluating monitoring results;
    - Frequency of monitoring and reporting;
    - Process for reviewing monitoring data and how decisions will be made regarding the ongoing management strategy;
    - The length of time for which monitoring is expected to continue;
    - The regulatory authorities involved and the management inputs required from each;
    - The integration of environmental management and monitoring measures for soil and groundwater;
    - Health and safety requirements for particular activities;
    - A program of review and audits;
    - The provisions in the EMP are feasible (i.e., able to be implemented) and able to be legally enforceable (i.e., a mechanism exists, such as development consent conditions, to give the plan a basis in law); and
    - The relevant consent authority is satisfied that the inclusion of a development consent condition relating to the implementation of the EMP is acceptable;
- Corrective action procedures to be implemented where EMP assessment criteria are breached.

The EMP will be provided to the appointed Site Auditor for review and approval prior to preparation of the SAS and SAR.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

9. Contingency Plan

A review of the proposed contamination-related aspects of the works associated with development the site has been undertaken and has identified a number of potential risks, outlined in the following sections that required the development of contingencies to ensure that the objectives of this RAP are met.

The Contingency Plan is required to be part of the REMP, as described in **Section 10**, below, and part of the Work Health and Safety Plan (WHSP), as described in **Section 10**.

9.1 Unexpected Finds

The possibility exists for hazards that have not been identified to date to be present within fill materials or underlying pavements/building on the site. The nature of hazards which may be present and which may be discovered at the site are generally detectable through visual or olfactory means, for example:

- The presence of significant aggregates of friable asbestos materials (visible) as opposed to minor occurrences of fragments or fibre bundles in soil; and/or
- Excessive quantities of Construction/Demolition Waste (visible); and/or
- Hydrocarbon impacted materials (visible/odorous); and/or
- Drums, waste pits, former pipework or USTs (visible); and/or
- Oily Ash and/or oily slag contaminated soils/fill materials (visible/odorous); and/or
- Tarry like impacted soil/fill material (visible/odorous); and/or
- Potential chlorinated hydrocarbon impact (sweet odour soils).

As a precautionary measure to ensure the protection of the workforce and surrounding community, should any of the abovementioned substances (or any other unexpected potentially hazardous substance) be identified, the procedure summarised in **Figure 9.1** is to be followed.

An enlarged version of the Unexpected Finds Protocol, suitable for use on the site, should be posted in the Site Office and referred to during the site-specific induction by the Principal Contractor.

The sampling strategy for each “unexpected find” shall be designed by a suitably qualified environmental consultant. The strategy will, however, be aimed at determining the nature of the substance – that is, is it hazardous and, if so, is it at concentrations which pose an unacceptable risk to human health or the environment.

The sampling frequency of the identified substance/materials shall meet the minimum requirements outlined in EPA (1995) in addition to those outlined in **Section 8**.

9.1.1 Change in Development Plans

In the event that the development plans are changed from those available at the time of preparation of this RAP, particularly where changes in nominated land use, basements to intercept impacted groundwater or beneficial reuse of groundwater, consideration of the suitability of the proposed remedial strategy will be required.

Development plans should be reviewed in detail to identify any inconsistencies with the assumptions presented herein, and those inconsistencies addressed in site-specific RWPs, as discussed in **Section 10.1**.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

9.1.2 Identification of Additional Underground Storage Tank

There is the potential that one or more additional USTs may be encountered during demolition of the pavements or subsequent earthworks. In the event of such an occurrence, the Unexpected Finds Protocol as discussed below (**Figure 9.1**) will be implemented.

9.1.3 Identification of Oily or Tarry Materials

In the event that oily/tarry materials are encountered, the provisions outlined in the Unexpected Finds Protocol will be implemented, comprising inspection, testing and appropriate action as advised by the Field Scientist (**Figure 9.1**).

Any suspected oily/tarry materials must be segregated from other excavated materials and placed in a designated area with appropriate odour and sediment controls until such time as appropriate assessment is completed and a methodology is confirmed for their appropriate management. In the event that the oily/tarry materials do not meet the site validation criteria, then they shall be stored in a secure area for later treatment or classified and removed from the site for treatment and/or disposal at an appropriately licensed facility.

9.1.4 Identification of Chlorinated Hydrocarbon Impact

In the event that chlorinated hydrocarbon impacted materials are encountered outside of the remedial area presented in **Figure 6** (potentially as a result of the identification of sweet odours in soils), the provisions outlined in the Unexpected Finds Protocol will be implemented, comprising inspection, testing and appropriate action as advised by the Field Scientist (**Section 9.1**).

Any suspected chlorinated hydrocarbon impacted materials must be segregated from other excavated materials and placed in a designated area with appropriate odour and sediment controls until such time as appropriate assessment is completed and a methodology is confirmed for their management. In the event that the materials do not meet the site validation criteria, then they shall be stored in a secure area for later treatment or classified and removed from the site for treatment and/or disposal at an appropriately licensed facility.

9.1.5 Material Storage Breach

In the event that any materials storage containment controls are breached and stockpiled materials classified as asbestos contaminated soil or otherwise have escaped (or have the potential to escape), then the management controls shall be rectified and investigations undertaken to review the adequacy of the controls and any improvements implemented. The REMP (**Section 10**) shall include a documented process for identifying and responding to such incidents.

9.1.6 Emissions Complaints

Due to the nature of the activities and type of contaminants identified within the site, there is a potential for complaints to be received from members of the public and/or occupants of surrounding properties relating to environmental emissions including:

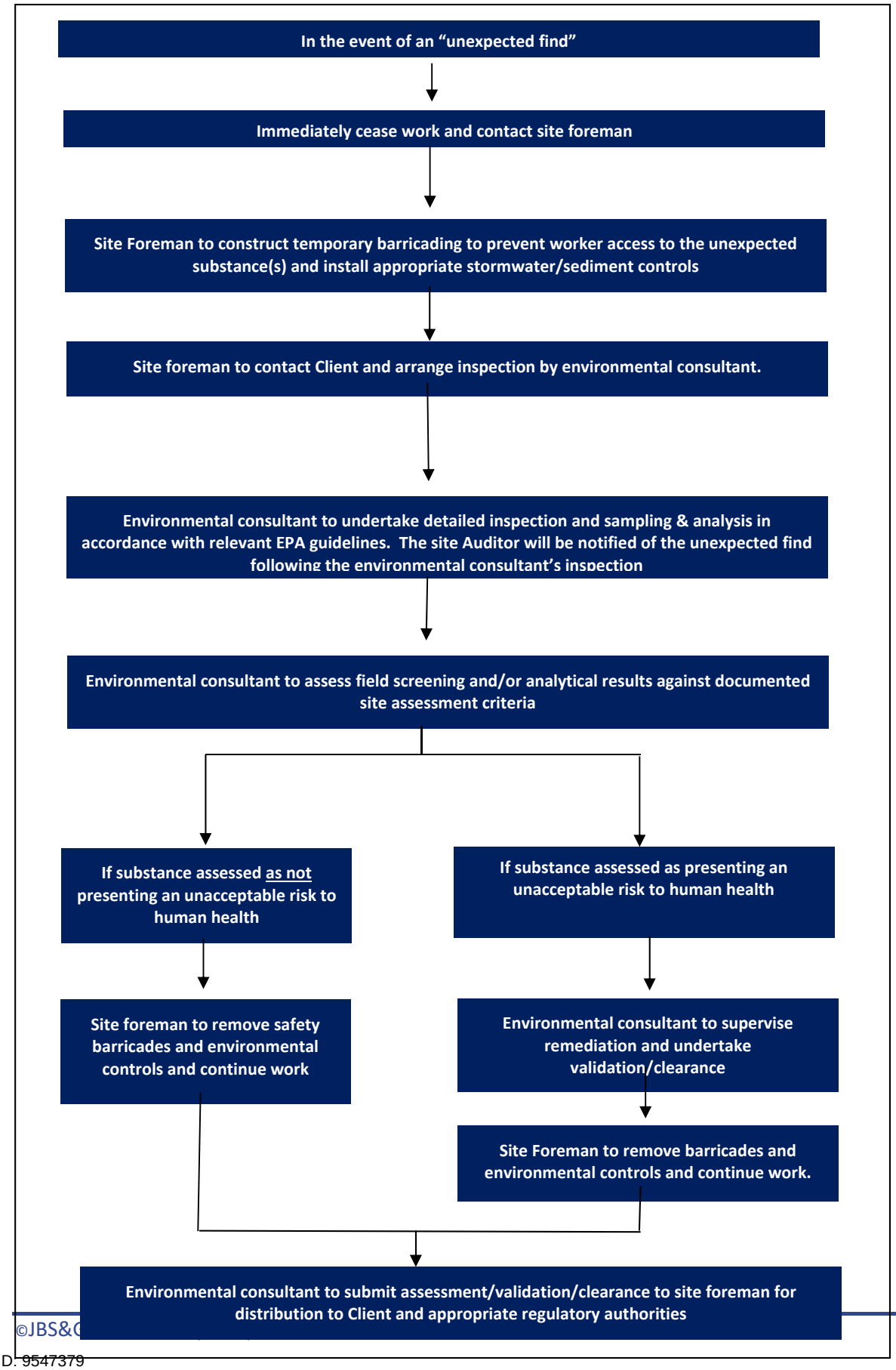
- Odour emissions arising from handling of malodorous soil;
- Noise and vibration arising from excavation, piling and other works;
- Dust emissions arising from excavation, material handling and placement; and
- Visibly impacted water quality in surface water discharge from the site.

Monitoring of all environmental emissions shall be undertaken during the works as detailed in the REMP (discussed in **Section 10**) and appropriate actions taken to further control emissions following receipt of a complaint. The REMP shall contain provision for contingency actions where excessive emissions occur, however it is anticipated that one or more of the following actions will be considered:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Increased application of odour screening/masking chemicals on odorous materials;
- Disturbance of soils during meteorologically favourable periods only; and/or
- Covering of impacted soils.

Figure 9.1 - Unexpected Finds Protocol



Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

10. Other Remediation Documents

10.1 Remedial Works Plans

As the proposed redevelopment / remediation staging becomes available, stage specific RWPs are required to be prepared. The RWPs will document the stage specific development details and identify any outstanding data gaps which are required to be addressed prior to implementation of the RWP. The RWPs will at least require:

- Identification of areas requiring additional environmental assessment including:
  - The extent of the area;
  - The required assessment method and proposed sampling locations (if appropriate);
  - Constituents of potential concern; and
  - Data quality objectives for validation of the area.
- Identification of areas requiring containment and proposed method of containment;
- Identification of areas of known / potential petroleum hydrocarbon impact and proposed remediation / treatment / disposal method;
- Validation methods and requirements for implementation of capping and treatment of petroleum hydrocarbon impacted soils;
- An UFP;
- An environmental management plan (EMP) to control potential emissions from remediation works. This should be particularly cognisant of particulates with elevated levels of PAHs and asbestos fibres;
- A Work Health and Safety Plan (WHSP) to be applied during the course of the remedial works to assess potential health and safety risks, appropriate measures to mitigate these risks and associated monitoring to assess actual risks;
- A Community Consultation Plan to notify all stakeholders including occupiers of neighbouring properties of the activities on the site; and
- The requirements for any long term/ongoing Environmental Management Plans to be applied long term after the completion of remediation / management works. Identification of the requirement, and associated validation, of any materials to be imported to/exported from site.

10.2 Environmental Management

10.2.1 Preparation of a Remediation Environmental Management Plan

Prior to commencement of remediation works, a REMP shall be prepared by the Principal Contractor or the Principal Contractors Remediation Contractor, which documents the environmental monitoring and management measures required to be implemented during the remediation and construction related activities associated with the construction of the site.

The REMP shall address each of the nominated items in **Section 10.2.2** and shall include the Contingency Plan, referred to in **Section 9**, above. Additional environmental management requirements may be required as part of development consent.

10.2.2 Required Elements/Procedures

An assessment of the proposed activities and the associated elements required to be incorporated into the REMP is provided in **Table 10.1**. The REMP is required to address each of the required

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

elements and procedures in full detail and to include detailed monitoring processes and procedures, corrective actions and reporting requirements.

Table 10.1 Required Elements of the REMP

Element	Specific Minimum Requirements to be included in REMP
1. Dust and Airborne Hazard Control	Dust and asbestos air monitoring. Provisions for dust control based on monitoring results.
2. Flora and Fauna	As appropriate.
3. Heritage/Archaeological	In accordance with relevant heritage/archaeological studies.
4. Visual Impacts	Visual monitoring at site boundary Specific colour requirements for various controls/measures, including PPE (e.g., navy coveralls)
5. Emergency Response	As appropriate. Procedures required for spill incident response including material storage breach.
6. Noise Control	Hours of operation, consistent with the consent conditions. Boundary monitoring at commencement of work site activities with Procedures for control and management of noise emissions, as appropriate (e.g., restricted hours).
7. Traffic	Controls on vehicle movements on public roads. Controls on transport of tar impacted materials.
8. Protection of Adjoining Structures	As appropriate.
9. Odour Control and Volatile Contaminant Exposure	Management of all potential gaseous phase volatile contaminant generating activities (i.e., excavation of VOC contaminated soils and treatment) with appropriate vapour controls incorporating safeguards and monitoring. Daily monitoring of odour levels at site boundary during handling of malodorous materials. Procedures for addressing elevated odour monitoring results, including, but not limited to: reduction in earthworks activities within odorous material areas during adverse meteorological conditions; application of odour masking solutions at the odour source or between identified source(s) and receptor(s); review of bio-pile operation and covering identified potential odour sources by hydro-mulching or with less odorous materials.
10. Handling of Contaminated Soil and Groundwater	Soil and water management (stockpiling, site access, excavation pump out, reinstatement).
11. Soil Storage/Placement Areas	Soil and water management (stockpiling, site access, excavation pump out, reinstatement). Bunding. Heavy vehicle/personnel decontamination. Interim storage requirements for materials requiring later treatment. Site drainage requirements, incorporating clean/dirty areas and modifications to existing surface water and drainage controls beneath retained pavements. Monitoring as required.
12. Sediment Control	Bunding. Collection/treatment/handling impacted sediments.
13. Operation of Site Office	As appropriate.
14. Decontamination of Heavy Equipment	As appropriate.
15. Environmental Monitoring	Monitoring of dusts, noise, odour and fibres. Monitoring as required for vibration and water releases. Inspection checklists and field forms. Monitoring within the Locomotive Workshop is required as per the requirements of the EMP and HHRA.
16. Environmental Criteria	Soil and water criteria as presented in this RWP
17. Material Classification	As detailed in this RWP. Materials tracking, including QA/QC inspection and sampling.
18. Community Relations Plan	Specific communication protocols, incorporating nomination of specific contact persons & details and requirements for communications/response register.
19. Incident Reporting	As appropriate, including standard form/checklist.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Element	Specific Minimum Requirements to be included in REMP
20. Security and Signage	Secure site perimeter. Site boundary signage.
21. EMP Review	As appropriate.
22. Training	As appropriate.
23. Contact Details	Company/personnel details, including names/phone numbers for: - Principal Contractor - Site Auditor - Remediation Consultant - Remediation Contractor - OH&S Compliance - Environmental Compliance
24. Stockpiling	All materials stockpiled onsite will be managed by the Remedial Contractor. Unique identification will be provided for each stockpile, the source of the stockpile, its estimated volume, material characterisation and its location onsite (via GPS) will also be recorded consistent with the Material Tracking Plan provided as **Section 8.6.12**. The following procedures will be implemented by the Remedial Contractor: No stockpiles of soil or other materials shall be placed on footpaths or nature strips unless prior Council approval has been obtained; All stockpiles of soil or other materials shall be placed away from drainage lines gutters or stormwater pits or inlets; All stockpiles of soil or other materials likely to generate dust or odours shall be covered; All stockpiles of chemically contaminated soil shall be stored in a secure area and be covered if remaining more than 24 hours; and All stockpiles of asbestos contaminated soils shall be kept damp and covered to minimise potential fibre release, and if left for more than 24 hours, be stored in a secure area.

10.2.3 Certification

Prior to commencement of remediation works, the Remediation Contractor is required to have the REMP endorsed as acceptable by the Environmental Consultant and Site Auditor appointed to validate the works.

A copy of the REMP and the endorsement to the satisfaction of Environmental Consultant or Site Auditor are required to be provided by the Principal Contractor/Remedial Contractor prior to commencement of remediation works.

10.2.4 Hours of Site Operation/Duration of Works

Remediation works shall be completed in accordance with the permissible hours of work and noise as nominated in of the Development Consent.

The appointed remediation contractor will be required to include a proposed schedule of remediation works within the REMP submitted for endorsement as discussed above.

Typical working hours presented following:

- Monday to Friday: 7am to 5pm; and
- Saturday: 8am to 1pm.

10.3 Health and Safety

10.3.1 Work Health and Safety Management Plan

A WHSP shall be prepared by the Remediation Contractor prior to commencement of remediation works. The Plan shall contain procedures and requirements that are to be implemented as a minimum during the works, in addition to the Contingency Plan, referred to in **Section 9**.

The objectives of the WHSP are:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- To apply standard procedures that minimises risks resulting from the works;
- To ensure all employees are provided with appropriate training, equipment and support to consistently perform their duties in a safe manner; and
- To have procedures to protect other site workers and the general public.

These objectives will be achieved by:

- Assignment of responsibilities;
- An evaluation of hazards;
- Establishment of personal protection standards, mandatory safety practices and procedures;
- Monitoring of potential hazards and implementation of corrective measures; and
- Provision for contingencies that may arise while operations are being conducted within the site.

10.3.2 Additional Site-Specific Elements/Procedures

In addition to the normal construction-related matters, the WHSP shall address the following site-specific specific hazards associated with the works relating to the management of contaminated soil and groundwater:

- Under/aboveground services, specifically potential petroleum infrastructure;
- Use of plant and machinery within confined spaces (i.e. tank pit excavations);
- Contact to asbestos contaminated soils, including friable asbestos;
- Contact with contaminated soil (heavy metals, TRH and PAHs), groundwater and vapours, including requirements for specific Personal Protective Equipment (PPE); and
- Heat/cold stress.

10.3.3 Asbestos

The WHSP will include an overview of the asbestos management plan (AMP) and shall comply with relevant NSW regulations.

During the remedial works, perimeter asbestos in air monitoring will be conducted at each applicable remedial works area boundary when soils with asbestos are being disturbed. Air monitoring will be conducted on a daily basis at relevant locations whilst disturbance of asbestos contaminated areas takes place.

Air monitoring will be conducted during any ground disturbance activities within impacted soil within the site to verify that implementation of appropriate control measures have been successful at managing the risk of air borne fibre generation. Air monitoring will be undertaken in accordance with the requirements of the National Occupational Health and Safety Commission (NOHSC) Asbestos Code of Practice and Guidance Notes, in particular the *Guidance note for the estimation of airborne asbestos dust* [NOHSC 3002:2005].

10.3.4 Additional Consideration of Chemical Contaminants

In addition to general assessment of the potential for exposure to chemical contaminants the WHSP should also include specific consideration of additional contaminants such as chlorinated hydrocarbon impacts to soils and lead and PAHs distributed throughout fill materials.

Volatile organic compound concentrations in air should be actively monitored throughout remediation works and any time that workers disturb potentially impacted soils. The services of an occupational hygienist are required full time during impacted soil disturbance activities to determine

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

the controls required to minimise potential health/safety risks to an acceptable level. When working with contaminated materials in general, care needs to be taken to ensure that the contamination is not introduced to the worker via ingestion, inhalation or absorption. The WHSP must detail the PPE and decontamination requirements to be followed to control the risks posed by potential exposure to chemical contaminants at/within the site.

As a precautionary measure, the WHSP should include the requirement for the plan to be revised in the event of an unexpected find of contaminated material during remediation and/or construction.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

11. Conclusions and Recommendations

11.1 Conclusions

Overall, it is considered that the proposed actions outlined in this RAP conform to the requirements of the *Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme (3rd Edition)* (EPA 2017) because they are: technically feasible; environmentally justifiable; and consistent with relevant laws policies and guidelines endorsed by NSW EPA.

Subject to the successful implementation of the measures described in this RAP and the recommendations below, it is concluded that the site can be made suitable for the intended uses and that the risks posed by contamination can be managed in such a way as to be adequately protective of human health and the environment.

11.2 Recommendations

It is recommended that the processes outlined in this RAP be utilised to inform site specific RWPs and subsequently implemented, and that the following documentation be developed and implemented to ensure the risks and impacts during remediation works are controlled in an appropriate manner:

- Individual stage RWPs;
- A REMP, to document the monitoring and management measures required to control the environmental impacts of the works and ensure the validation protocols are being addressed; and
- A WHSP to document the procedures to be followed to manage the risks posed to the health of the remediation workforce.

During the period preceding remediation of the site, ongoing monitoring of potential risks to site receptors shall be completed in accordance with JBS&G (2019c[26])

The REMP and WHSP will require to be cognisant of the potential occurrence and storage/handling of asbestos contaminated soils.

Upon completion of the works, or within various specific areas, validation report(s) are required to be submitted by the Remediation Consultant to the Site Auditor for certification that the site, or relevant portion(s) are suitable for the proposed uses.

[26] *Penrith Central Park – Environmental Monitoring Plan*. JBS&G Australia dated 1 March 2019 Reference 55073/110468, JBS&G (2019c)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

12. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

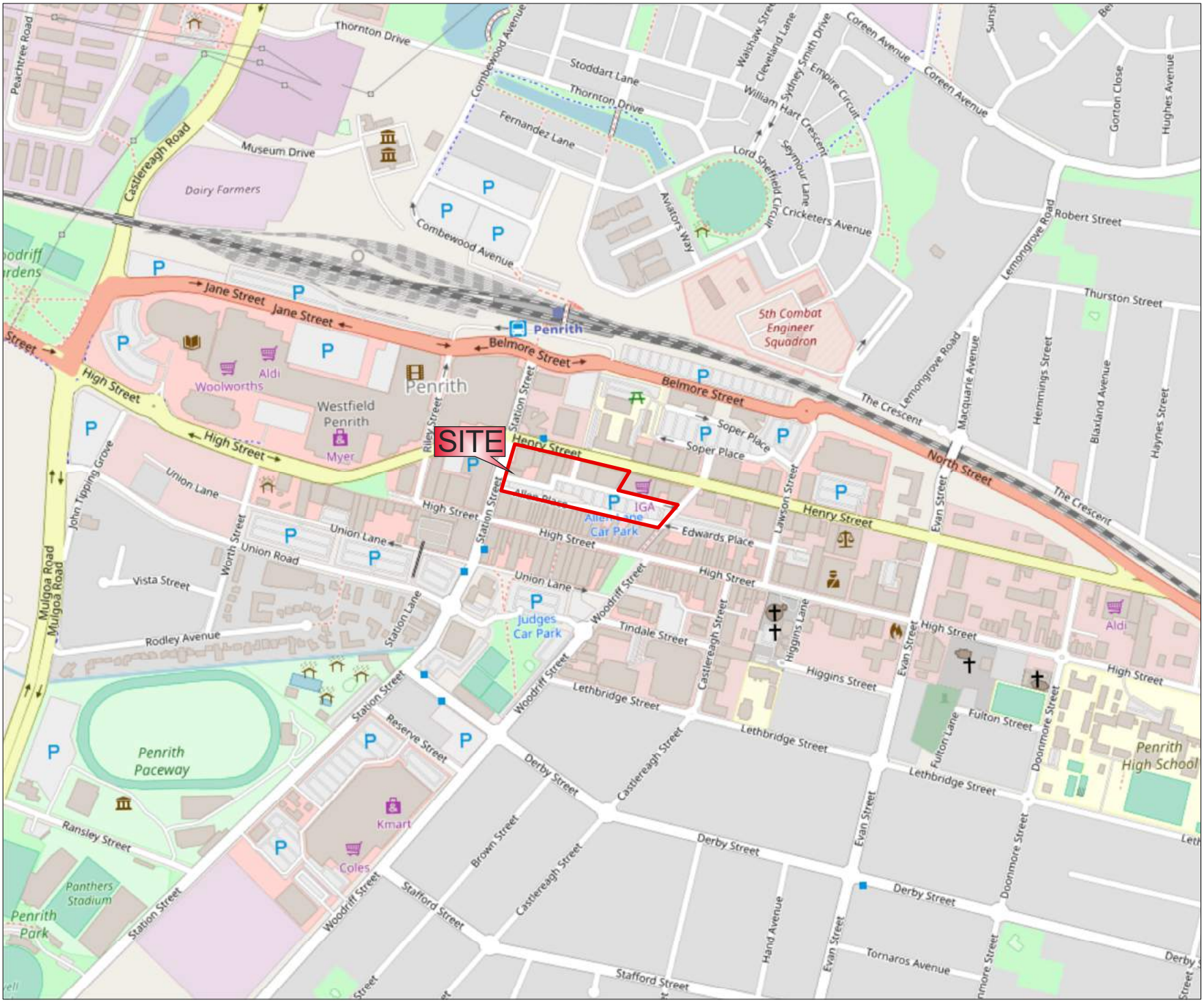
Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figures

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



Legend:

Approximate Site Boundary

JBS&G

Job No: 55073

Client: Penrith City Council

Version: R02 Rev A	Date: 16-Nov-2018
Drawn By: AV	Checked By: RH

Scale 1:8,500

0 100 200

metres

Coor. Sys. GDA 1994 MGA Zone 56

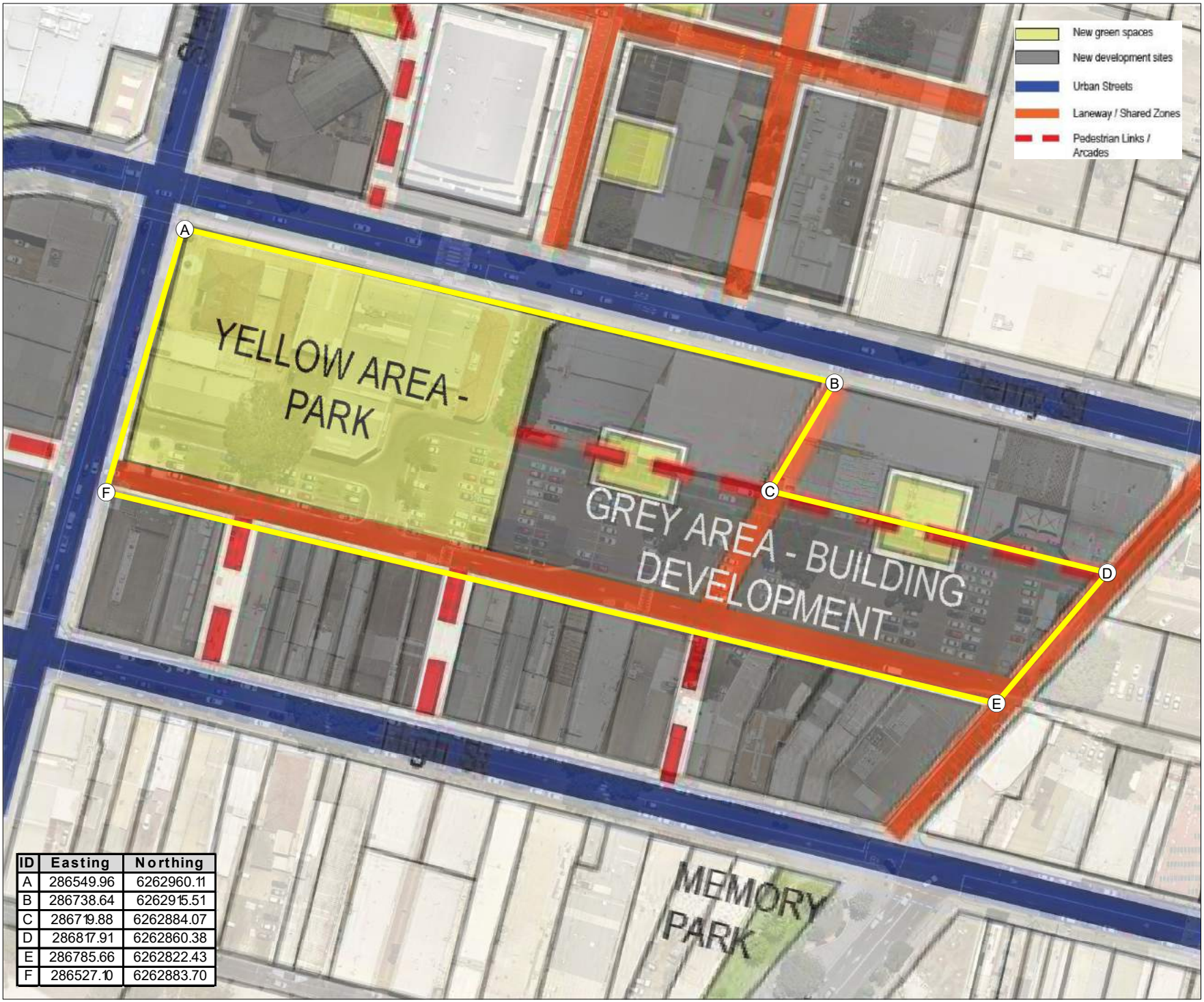
114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

SITE LOCATION

FIGURE 1

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Reference: © OpenStreetMap (and) contributors, CC-BY-SA



ID	Easting	Northing
A	286549.96	6262960.11
B	286738.64	6262915.51
C	286719.88	6262884.07
D	286817.91	6262860.38
E	286785.66	6262822.43
F	286527.10	6262883.70

Legend:

Approximate Site Boundary

JBS&G

Job No: 55073

Client: Penrith City Council

Version: R02 Rev A | Date: 16-Nov-2018

Drawn By: AV | Checked By: RH

Scale 1:1,500

0 10 20
metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

DEVELOPMENT SITE LAYOUT

FIGURE 2

Path: G:\Projects\55073 Penrith City Council\55073 Central Park Village Overarching RAP\04 GIS\Maps\R02 Rev A\55073_02_SiteLay.mxd
Reference: Near Map www.nearmap.com, imagery date 20-01-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Approximate Site Boundary
- Sewerage Infrastructure / Preferential Pathway
- 134-138 Henry Street
- 118-120 Henry Street
- Transformer Location

JBS&G

Job No: 55073

Client: Penrith City Council

Version: R02 Rev A	Date: 20-Nov-2018
Drawn By: AV	Checked By: RH

Scale 1:1,000

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

SITE LAYOUT AND AREAS OF ENVIRONMENTAL CONCERN

FIGURE 3

J:\Projects\55073 Penrith City Council\55073 Central Park Village Overarching RAP\04 GIS\Maps\R02 Rev A\55073_03_AreasEnvConcern.mxd
Reference: Near Map www.nearmap.com, imagery date 20-01-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Approximate Site Boundary
- Approximate Lot Boundary

Sample Location

- PSM Groundwater Monitoring Well
- JBS&G Groundwater Monitoring Well
- JBS&G Borehole
- JBS&G Hand Auger

JBS&G

Job No: 55073	
Client: Penrith City Council	
Version: R02 Rev A	Date: 20-Nov-2018
Drawn By: AV	Checked By: RH

Scale 1:1,500

0 20 40
metres

Coor. Sys. GDA 1994 MGA Zone 56

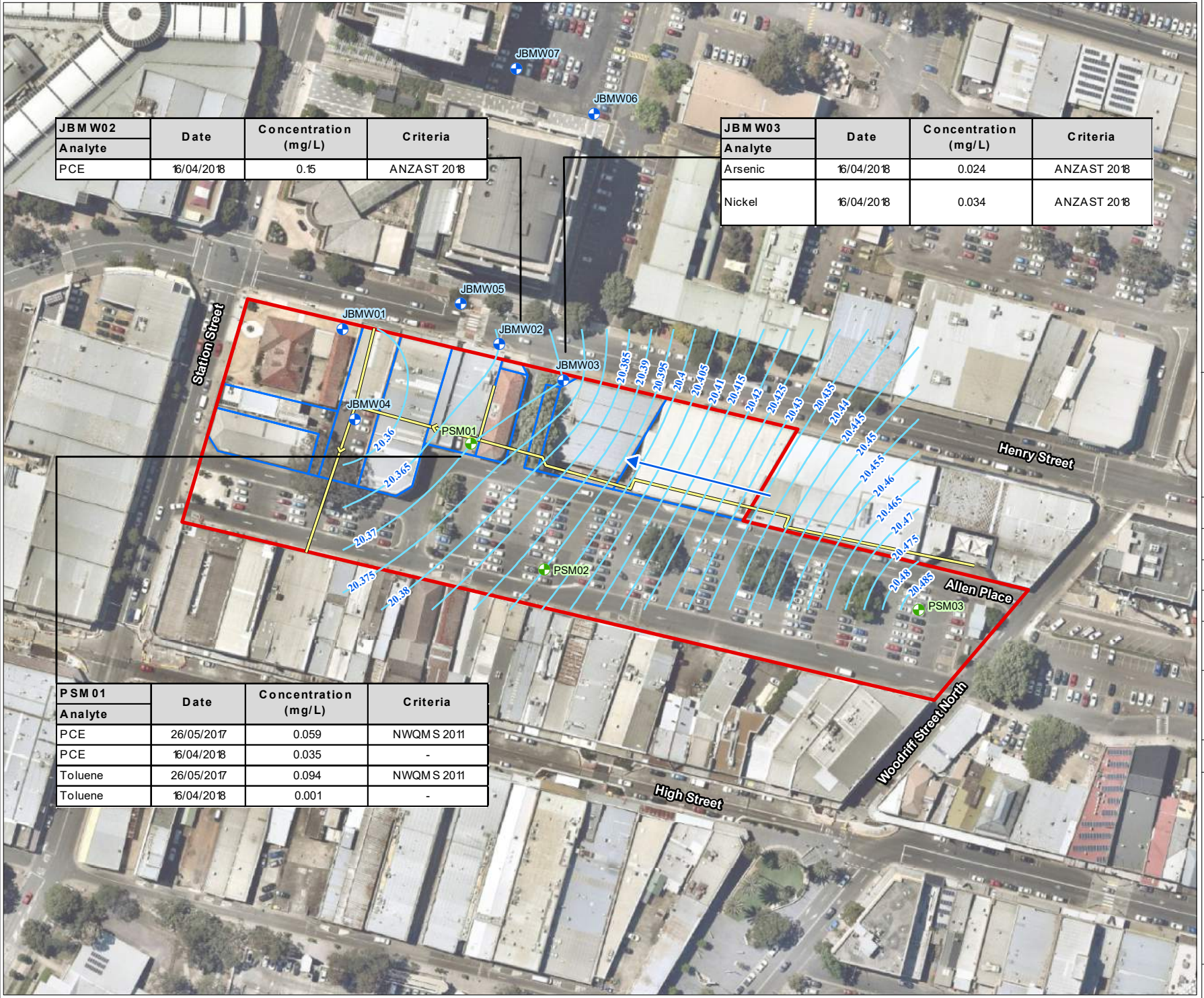
114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

HISTORICAL SOIL SAMPLE LOCATIONS AND TIER 1 EXCEEDANCES

FIGURE 4A

Document Path: C:\Projects\55073 Penrith City Council\55073 Central Park Village Overarching RAP\04 GIS\Maps\R02 Rev A\55073_04A_HistoricalSoilSamples.mxd
Reference: Near Map www.nearmap.com, imagery date 30-10-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



JBMW02 / Analyte	Date	Concentration (mg/L)	Criteria
PCE	16/04/2018	0.15	ANZAST 2018

JBMW03 / Analyte	Date	Concentration (mg/L)	Criteria
Arsenic	16/04/2018	0.024	ANZAST 2018
Nickel	16/04/2018	0.034	ANZAST 2018

PSM01 / Analyte	Date	Concentration (mg/L)	Criteria
PCE	26/05/2017	0.059	NWQMS 2011
PCE	16/04/2018	0.035	-
Toluene	26/05/2017	0.094	NWQMS 2011
Toluene	16/04/2018	0.001	-

Legend:

- Approximate Site Boundary
- Approximate Lot Boundary
- Sewerage Infrastructure / Preferential Pathway
- Groundwater Contours (m AHD)
- Inferred Groundwater Flow Direction

Sample Location

- PSM Well
- JBS&G Groundwater Monitoring Well

JBS&G

Job No: 55073

Client: Penrith City Council

Version: R02 Rev A | Date: 19-Nov-2018

Drawn By: AV | Checked By: RH

Scale 1:1,750

0 20 40
metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

GROUNDWATER WELL LOCATIONS, TIER 1 EXCEEDANCES & INFERRED GROUNDWATER FLOW DIRECTION

FIGURE 4B

Path: G:\Projects\55073 Penrith City Council\55073 Central Park Village Overarching RAP\04 GIS\Maps\R02 Rev A\55073_04B_GWLoc.mxd
Reference: Near Map www.nearmap.com, imagery date 30-10-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Approximate Site Boundary
- Approximate Lot Boundary
- Sewerage Infrastructure / Preferential Pathway

Sample Location

- JBS&G Soil Vapour

JBS&G

Job No: 55073

Client: Penrith City Council

Version: R02 Rev A	Date: 16-Nov-2018
Drawn By: AV	Checked By: RH

Scale 1:1,500

0 20 40

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

SOIL VAPOUR SAMPLE LOCATIONS & TIER 1 EXCEEDANCES

FIGURE 4C

Document Path: C:\Users\rhoward\Documents\Projects\55073 Soil\55073 Central Park Village Overarching RAP\04 GIS\Maps\R02 Rev A\55073_04C_SoilVapour.mxd
Reference: Near Map www.nearmap.com, imagery date 20-01-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Approximate Site Boundary
- Approximate Lot Boundary
- Former Dry Cleaner
- 1/134-138 Henry Street
- Shop 3 - 140 Henry Street
- External Alleyway
- Sewerage Infrastructure / Preferential Pathway

Investigation_Locations

- JBS&G Ambient Air Sample Location
- JBS&G Borehole
- JBS&G Groundwater Monitoring Well
- JBS&G Hand Auger
- JBS&G Soil Vapour
- PSM Well

JBS&G

Job No: 55073

Client: Penrith City Council

Version: R02 Rev A	Date: 21-Feb-2019
Drawn By: AV	Checked By: RH

Scale 1:400

0 5 10
metres

Coor. Sys. GDA 1994 MGA Zone 56

Shop 3 of 134-138 and 140 Henry Street, Penrith, NSW

FLOOR PLAN, INDOOR AIR AND IN-SITU ENVIRONMENTAL SAMPLING DATA

FIGURE 4D

Reference: Near Map www.nearmap.com, imagery date 20-01-2018
Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

Approximate Site Boundary

Depth of Fill

Value

1.9

0.7

0.15

JBS&G

Job No: 55073

Client: Penrith City Council

Version: R02 Rev A	Date: 20-Nov-2018
Drawn By: AV	Checked By: RH

Scale 1:1,500

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

DEPTH OF FILL MODEL

FIGURE 5

J:\Projects\55073 Penrith City Council\55073 Central Park Village Overarching RAP\04 GIS\Maps\R02 Rev A\55073_05_DepthFill.mxd

Reference: Near Map www.nearmap.com, imagery date 30-10-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Reference: Near Map www.nearmap.com, imagery date 20-01-2018

Legend:

- Approximate Site Boundary
- Sewerage Infrastructure / Preferential Pathway
- Approximate Lot Boundary
- AEC 1- Dry Cleaners Location
- AEC 2- Former Service Station Location
- Transformer

Contamination Impacts

- Former Service Station
- Inferred VOC Source Zone
- Trace Asbestos in Soil

JBS&G

Job No: 55073

Client: Penrith City Council

Version: R02 Rev A	Date: 06-Jun-2018
Drawn By: AV	Checked By: RH

Scale 1:1,400

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

CONTAMINATION IMPACTS

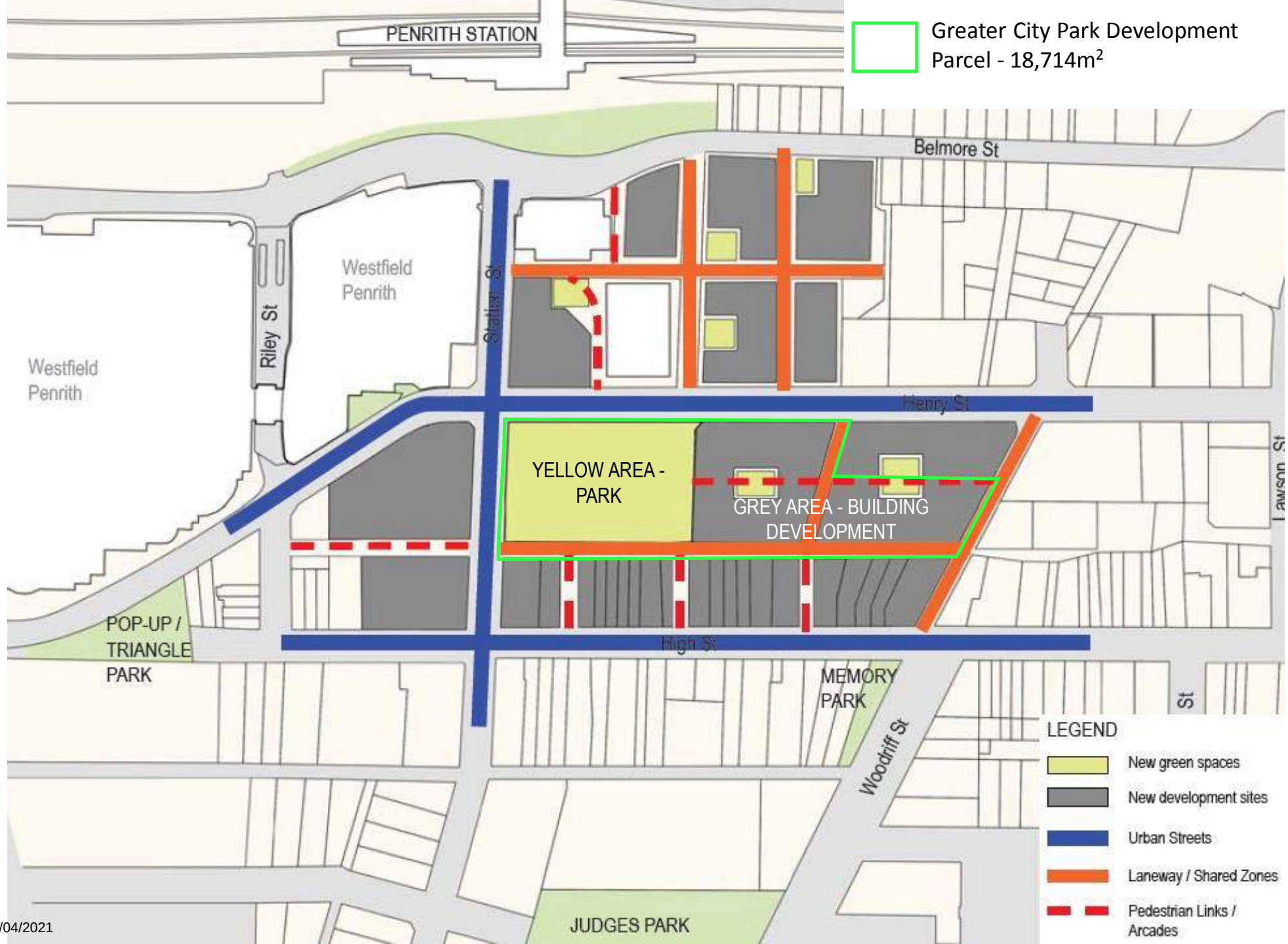
FIGURE 6

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix A Design Plans

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



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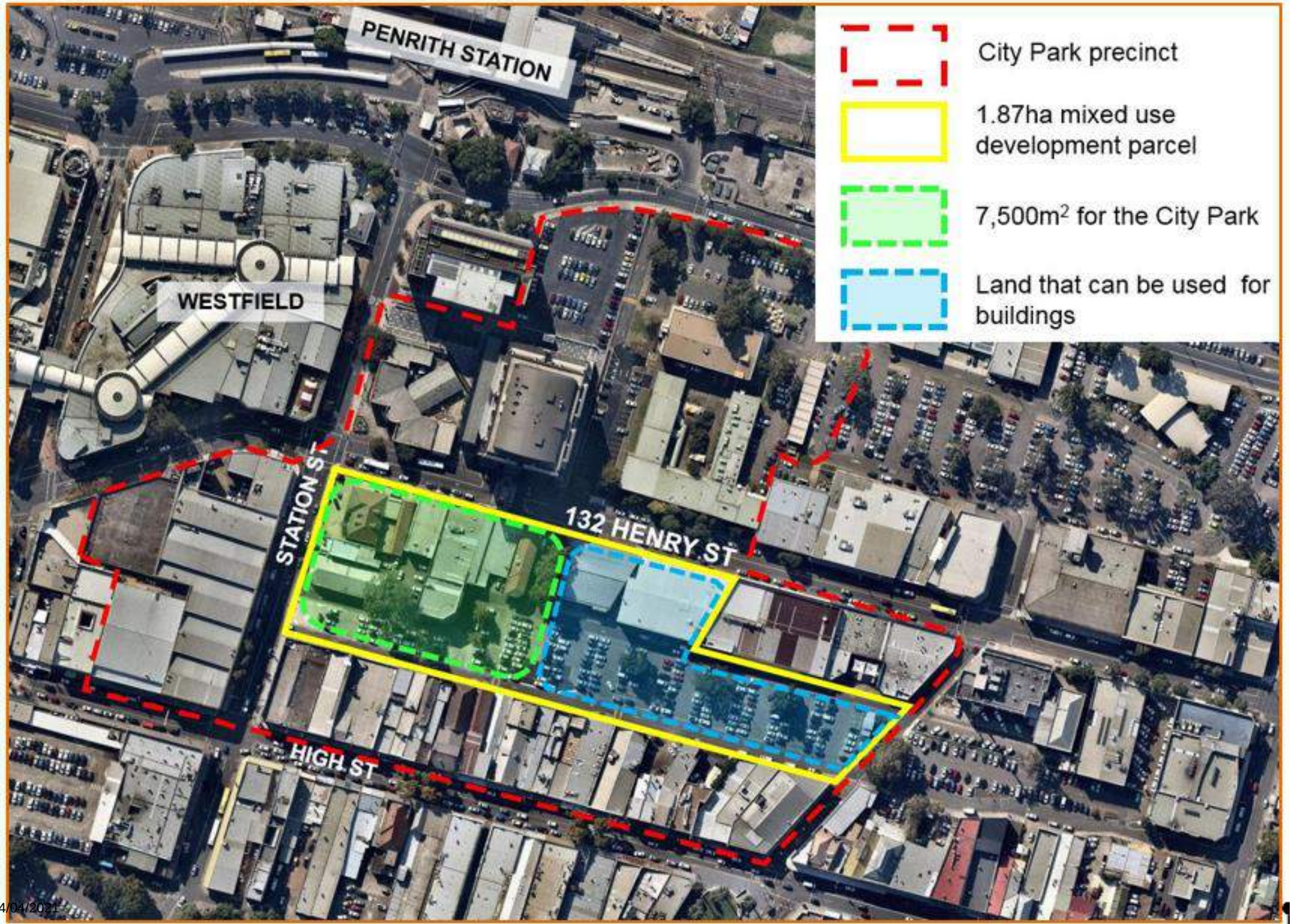

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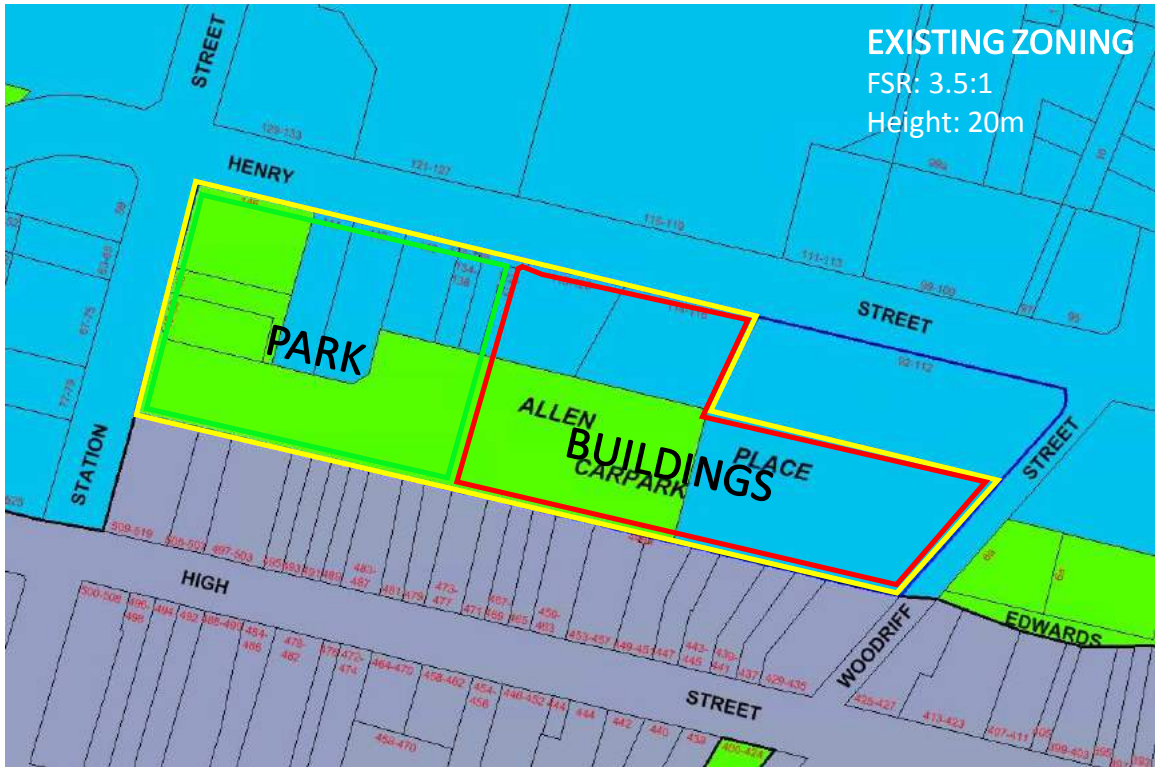

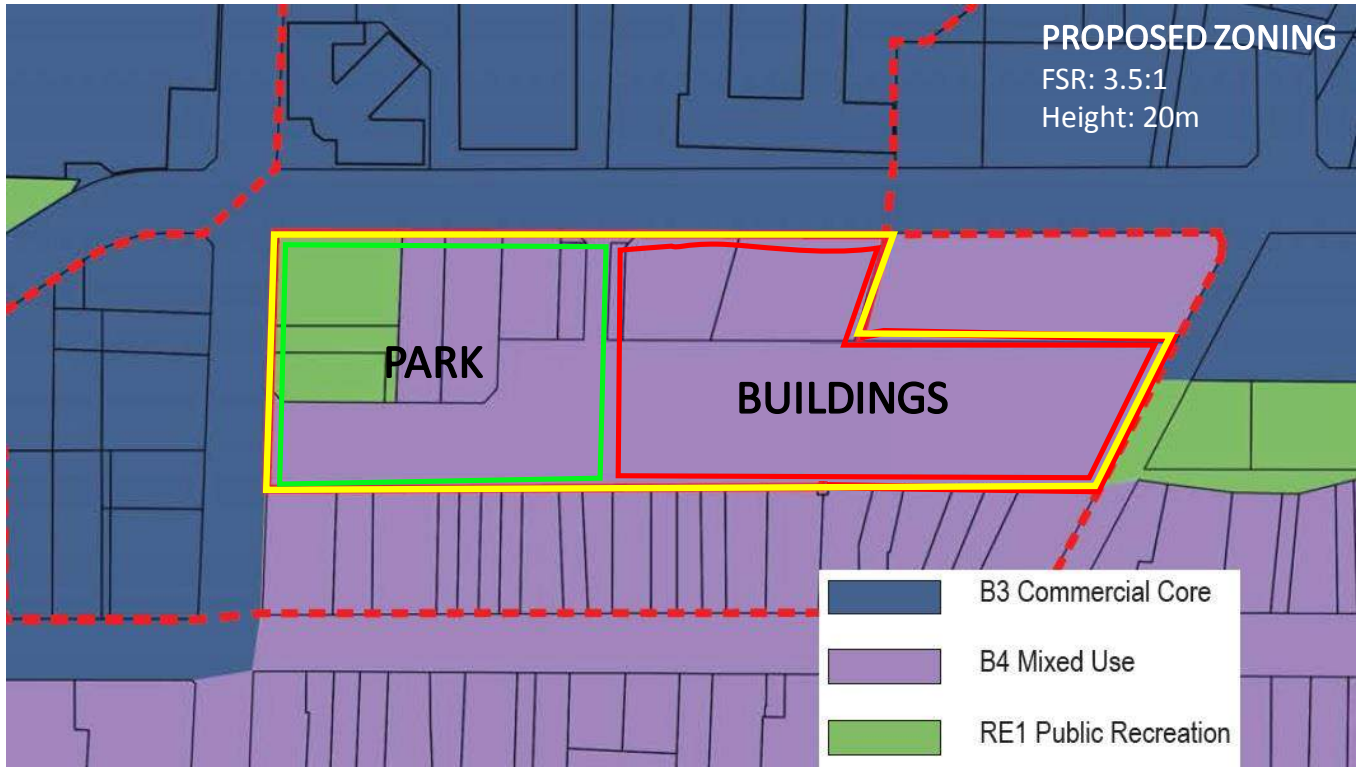

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix B EPA Searches

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Home Contaminated land Record of notices

Search results

Your search for:Suburb: PENRITH

Matched 6 notices relating to 1 site.

Search Again

Refine Search

Suburb	Address	Site Name	Notices related to this site
PENRITH	Castlereagh ROAD	Crane Enfield Metals	3 current and 3 former

Page 1 of 1

12 February 2018

For business and industry ()

For local government ()

Contact us

131 555 (tel:131555)

Online (http://www.epa.nsw.gov.au/about-us/contact-us/feedback/feedback-form)

info@epa.nsw.gov.au (mailto:info@epa.nsw.gov.au)

EPA Office Locations (http://www.epa.nsw.gov.au/about-us/contact-us/locations)

Accessibility (http://www.epa.nsw.gov.au/about-us/contact-us/website-service-standards/help-index)
Disclaimer (http://www.epa.nsw.gov.au/about-us/contact-us/website-service-standards/disclaimer)
Privacy (http://www.epa.nsw.gov.au/about-us/contact-us/website-service-standards/privacy)
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Find us on (https://www.linkedin.com/company/epansw)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

List of NSW Contaminated Sites Notified to EPA as of 22 December 2017

Background

A strategy to systematically assess, prioritise and respond to notifications under Section 60 of the *Contaminated Land Management Act 1997* (CLM Act) has been developed by the EPA. This strategy acknowledges the EPA's obligations to make information available to the public under *Government Information (Public Access) Act 2009*.

When a site is notified to the EPA, it may be accompanied by detailed site reports where the owner has been proactive in addressing the contamination and its source. However, often there is minimal information on the nature or extent of the contamination.

For some notifications, the information indicates the contamination is securely immobilised within the site, such as under a building or carpark, and is not currently causing any offsite consequences to the community or environment. Such sites would still need to be cleaned up, but this could be done in conjunction with any subsequent building or redevelopment of the land. These sites may not require intervention under the CLM Act, but could be dealt with through the planning and development consent process.

Where indications are that the nominated site is causing actual harm to the environment or an unacceptable offsite impact (i.e. it is a "significantly contaminated site"), the EPA would apply the regulatory provisions of the CLM Act to have the responsible polluter and/or landowner investigate and remediate the site.

As such, the sites notified to the EPA and presented in the following table are at various stages of the assessment and/or remediation process. Understanding the nature of the underlying contamination, its implications and implementing a remediation program where required, can take a considerable period of time. The tables provide an indication, in relation to each nominated site, as to the management status of that particular site. Further detailed information may be available from the EPA or the responsible landowner.

The following questions and answers may assist those interested in this issue:

Frequently asked questions

What is the difference between the "List of NSW Contaminated Sites Notified to the EPA" and the "Contaminated Land: Record of Notices"?

A site will be on the Contaminated Land: Record of Notices only if the EPA has issued a regulatory notice in relation to the site under the *Contaminated Land Management Act 1997*.

The sites appearing on this "List of NSW contaminated sites notified to the EPA" indicate that the notifiers consider that the sites are contaminated and warrant reporting to the EPA. However, the contamination may or may not be significant enough to warrant regulation by the EPA. The EPA needs to review and, if necessary, obtain more information before it can make a determination as to whether the site warrants regulation.

Why my site appears on the list?

Your site appears on the list because of one or more of the following reasons:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- The site owner and/or the person partly or fully responsible for causing the contamination notified to the EPA about the contamination under Section 60 of the *Contaminated Land Management Act 1997*. In other words, the site owner or the "polluter" believes the site is contaminated.
- The EPA has been notified via other means and is satisfied that the site is or was contaminated.

Does the list contain all contaminated sites in NSW?

No. The list only contains contaminated sites that the EPA is aware of, with regard to its regulatory role under the CLM Act. An absence of a site from the list does not necessarily imply the site is not contaminated.

The EPA relies upon responsible parties to notify contaminated sites.

How are these notified contaminated sites managed by the EPA?

There are different ways that the EPA manages these notified contaminated sites. First, an initial assessment is carried out by the EPA. At the completion of the initial assessment, the EPA may take one or more than one of the following management approaches:

- The contamination warrants the EPA's direct regulatory intervention either under the *Contaminated Land Management Act 1997* or the *Protection of the Environment Operations Act 1997* (POEO Act), or both. Information about current or past regulatory action on this site can be found on EPA website.
- The contamination with respect to the current use or approved use of the site, as defined under the *Contaminated Land Management Act 1997,* is not significant enough that it warrants EPA regulation.
- The contamination does not require EPA regulation and can be managed by a planning approval process.
- The contamination is related to an operational Underground Petroleum Storage System, such as a service station or fuel depot. The contamination may be managed under the POEO Act and the Protection of the Environment Operation (Underground Petroleum Storage Systems) Regulation 2008.
- The contamination is being managed under a specifically tailored program operated by another agency (for example the Department of Industry and Investment's *Derelict Mines Program*).

I am the owner of a site that appears on the list. What should I do?

First of all, you should ensure the current use of the site is compatible with the site contamination. Secondly, if the site is the subject of EPA regulation, make sure you comply with the regulatory requirements, and you have considered your obligations to notify other parties who may be affected.

If you have any concerns, contact us and we may be able to offer you general advice, or direct you to accredited professionals who can assist with specific issues.

I am a prospective buyer of a site that appears on the list. What should I do?

You should seek advice from the vendor to put the contamination issue into perspective. You may need to seek independent expert advice.

The information provided in the list is meant to be indicative only, and a starting point for your own assessment. Site contamination as a legacy of past site uses is not uncommon,

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

particularly in an urbanised environment. If the contamination on a site is properly remediated or managed, it may not materially impact upon the intended future use of the site. However, each site needs to be considered in context.

List of NSW Contaminated Sites Notified to the EPA

Disclaimer

The EPA has taken all reasonable care to ensure that the information in the list of contaminated sites notified to the EPA (the list) is complete and correct. The EPA does not, however, warrant or represent that the list is free from errors or omissions or that it is exhaustive.

The EPA may, without notice, change any or all of the information in the list at any time.

You should obtain independent advice before you make any decision based on the information in the list.

The list is made available on the understanding that the EPA, its servants and agents, to the extent permitted by law, accept no responsibility for any damage, cost, loss or expense incurred by you as a result of:

1. any information in the list; or
2. any error, omission or misrepresentation in the list; or
3. any malfunction or failure to function of the list;
4. without limiting (2) or (3) above, any delay, failure or error in recording, displaying or updating information.

Site Status	Explanation
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or *Protection of the Environment Operations Act 1997*. Alternatively, the EPA may require information via a notice issued under s77 of the *Contaminated Land Management Act 1997* or issue a Preliminary Investigation Order.
Regulation under CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the *Contaminated Land Management Act 1997* is not required.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997*. A regulatory approach is being finalised.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the *Protection of the Environment Operations Act 1997* (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the *Environmental Planning and Assessment Act 1979* (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the *Protection of the Environment Operations Act 1997* (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the *Environmental Planning and Assessment Act 1979* (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the *Contaminated Land Management Act 1997* (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Suburb	Site Name	Site Address	Contamination Activity Type	EPA Management Class	Latitude	Longitude
PAMBULA	Offsite area (roadways) adjacent to United Service Station	Corner Quondola Street and Bullara STREET	Service Station	Regulation under CLM Act not required	-36.93104481	149.8746763
PARKES	BP Reliance East End Service Station Parkes	46 Clarinda STREET	Service Station	Regulation under CLM Act not required	-33.14243539	148.1846227
PARKES	BP Truckstop	(Newell Highway) 1 Forbes ROAD	Other Petroleum	Regulation under CLM Act not required	-33.14309226	148.1710282
PARKES	Caltex Service Station Parkes	352-360 Clarinda STREET	Service Station	Regulation under CLM Act not required	-33.13317454	148.173643
PARKES	Former BP Telescope Service Station	339-341 Clarinda STREET	Service Station	Regulation under CLM Act not required	-33.13216152	148.1743239
PARKES	Former Caltex Parkes (Mugincoble) Depot - Eugowra	Eugowra ROAD	Service Station	Regulation under CLM Act not required	-33.19007031	148.224822
PARKLEA	Caltex Parklea Service Station	Old Windsor (north of Miami Street) ROAD	Service Station	Regulation under CLM Act not required	-33.72427108	150.9388531
PARRAMATTA	7-Eleven (former Mobil) Service Station	81 Victoria ROAD	Service Station	Regulation under CLM Act not required	-33.80919769	151.0142894
PARRAMATTA	BP Service Station	435 Church STREET	Service Station	Regulation under CLM Act not required	-33.80498714	151.0056151
PARRAMATTA	Coleman Oval Embankment	Cnr of Pitt STREET and Maquarie STREET	Unclassified	Regulation under CLM Act not required	-33.80441625	150.9954841
PARRAMATTA	Parramatta Park Toilet Block Demolition	The Cresent Toilet Block Parramatta PARK	Unclassified	Regulation under CLM Act not required	-33.81054034	150.9961968
PAUPONG	Former Timber Treatment Plant	Off Paupong ROAD	Other Industry	Regulation under CLM Act not required	-36.57657408	148.6624998
PENDLE HILL	7-Eleven Service Station	217 Wentworth AVENUE	Service Station	Regulation under CLM Act not required	-33.8017814	150.9577994
PENNANT HILLS	Shell Coles Express Pennant Hills West	386 Pennant Hills ROAD	Service Station	Contamination currently regulated under CLM Act	-33.73936462	151.0680237
PENRITH	7-Eleven (former Mobil) Service Station	212-222 Andrews ROAD	Service Station	Regulation under CLM Act not required	-33.73059678	150.6952571
PENRITH	7-Eleven Service Station Penrith	30 Henry STREET	Service Station	Regulation under CLM Act not required	-33.75408799	150.7045594
PENRITH	BP Express Service Station	Corner Coreen Avenue and Castlereagh ROAD	Service Station	Regulation under CLM Act not required	-33.74385498	150.6925743
PENRITH	Caltex Penrith Service Station	153 Coreen AVENUE	Service Station	Regulation under CLM Act not required	-33.74287244	150.6927071
PENRITH	Caltex Service Station	Castlereagh Rd Cnr Lugard STREET	Service Station	Regulation under CLM Act not required	-33.73426843	150.6933382
PENRITH	Crane Enfield Metals	Castlereagh ROAD	Metal Industry	Contamination currently regulated under CLM Act	-33.73734959	150.696442
PENRITH	Jet 60 Dry Cleaners	Shop 3 134-138 Henry STREET	Unclassified	Under assessment	-33.75231953	150.6964541
PENRITH	Lowes Petroleum (Former Mobil) Depot Penrith	174 Coreen AVENUE	Other Petroleum	Regulation under CLM Act not required	-33.74484268	150.6980504
PENRITH	Mirvac Industrial Site	2101 Castlereagh ROAD	Other Industry	Regulation under CLM Act not required	-33.73497514	150.6954097
PENSHURST	7-Eleven Service Station	612 Forest ROAD	Service Station	Regulation under CLM Act not required	-33.96153533	151.0793525
PENSHURST	Caltex Service Station	641 King Georges ROAD	Service Station	Regulation under CLM Act not required	-33.95985335	151.0891118

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6357	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	POEO licence	Issued	07 Jun 2000
1007008	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	05 Jul 2002
1020003	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	09 Sep 2002
1072516	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	20 Aug 2007
1085783	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	21 Oct 2008
1104746	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	06 Aug 2009
1109805	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26 Feb 2010
1512576	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	12 Aug 2014
247	BORAL RESOURCES (NSW) PTY LTD	PEACHTREE ROAD, PENRITH, NSW 2750	POEO licence	No longer in force	22 Aug 2000
12405	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	09 Mar 2006
1070974	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	30 Jul 2007
1077652	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	31 Aug 2007
1109988	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19 Apr 2010
1525967	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	31 Oct 2014
1526072	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	11 Nov 2014
1098	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	26 Jun 2000
1017498	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	24 Nov 2003
1072470	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	20 Sep 2007
1104995	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	04 Nov 2009
1512789	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	Compliance Audit	Complete	13 Mar 2013

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Suburb - PENRITH

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Export to excel 2 of 4 Pages Search Again

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1512775	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19 Mar 2013
1515690	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26 Jul 2013
1525217	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26 Sep 2014
10945	CUMMINS SOUTH PACIFIC PTY. LTD.	7 Andrews Road, PENRITH, NSW 2750	POEO licence	Surrendered	19 Jun 2000
1035208	CUMMINS SOUTH PACIFIC PTY. LTD.	7 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	08 Mar 2004
308	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	17 Jan 2000
1024084	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	06 Jan 2003
1044228	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	08 Feb 2005
11290	ENDEAVOUR ENERGY	96-120 Blaikie Road, PENRITH, NSW 2750	POEO licence	No longer in force	08 Jan 2001
1035197	ENDEAVOUR ENERGY	96-120 Blaikie Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	08 Mar 2004
1526441	Glass Recovery Services Pty Ltd	126 Andrews Road, PENRITH, NSW 2740	s.91 Clean Up Notice	Issued	27 Jan 2015
1535765	Glass Recovery Services Pty Ltd	126 Andrews Road, PENRITH, NSW 2740	s.91 Clean Up Notice	Issued	23 Aug 2016
3085780565	Glass Recovery Services Pty Ltd	126 Andrews Road, PENRITH, NSW 2740	Penalty Notice	Issued	28 Oct 2016
20381	Glass Recovery Services Pty Ltd	126 Andrews Road, PENRITH, NSW 2740	POEO licence	Issued	07 Nov 2017
12132	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750	POEO licence	Surrendered	01 Oct 2004
1097227	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750	s.58 Licence Variation	Issued	02 Feb 2009
1104874	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750	s.58 Licence Variation	Issued	17 Aug 2009
6472	JAMES KEITH COSGROVE	8 HOYLE PLACE, PENRITH, NSW 2750	POEO licence	Surrendered	21 Jun 2000
1044521	JAMES KEITH COSGROVE	8 HOYLE PLACE, PENRITH, NSW 2750	s.58 Licence Variation	Issued	16 Feb 2005
7019	JAMISON PRIVATE HOSPITAL PROPERTY PTY LTD	366 JAMISON ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	20 Mar 2001

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Version: 1, Version Date: 14/04/2021

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Suburb - PENRITH

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Export to excel 3 of 4 Pages Search Again

Number	Name	Location	Type	Status	Issued date
2869	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	05 Jun 2000
1012903	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	18 Feb 2002
1525246	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	02 Oct 2014
1556498	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.96 Prevention Notice	Issued	08 Sep 2017
3741	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	31 Jan 2001
1007235	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	10 May 2001
1008444	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	20 Aug 2001
2818	PANASONIC AVC NETWORKS AUSTRALIA PTY LTD	164 STATION STREET, PENRITH, NSW 2750	POEO licence	Surrendered	24 Mar 2000
1048338	PANASONIC AVC NETWORKS AUSTRALIA PTY LTD	164 STATION STREET, PENRITH, NSW 2750	s.58 Licence Variation	Issued	31 May 2005
10349	SYDNEY OLYMPIC PARK AUTHORITY	CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	06 Jan 2000
1409	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	25 May 2000
1005313	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	22 Oct 2001
1017898	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26 Jun 2002
1018895	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	23 Dec 2002
1028330	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	08 Jul 2003
1032690	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	25 Nov 2003
1032982	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19 Mar 2004
1047700	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	30 Jun 2005
1061410	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	29 Jun 2006
1074754	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	27 Jun 2007

1234

12 February 2018

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Version: 1, Version Date: 14/04/2021

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Export to excel 4 of 4 Pages Search Again

Number	Name	Location	Type	Status	Issued date
1116048	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	02 Jul 2010
1129012	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	27 Jun 2011
1504851	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	28 Jun 2012
1528922	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	23 Mar 2015
1538189	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19 Feb 2016
11461	TOTAL CONCRETE SOLUTIONS PTY LIMITED	261 COOMBES DRIVE, PENRITH, NSW 2750	POEO licence	No longer in force	19 Oct 2001
1294	VICARY CORPORATION PTY LIMITED	60-62 REGENTVILLE ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	22 Aug 2000
12106	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	POEO licence	Surrendered	28 Apr 2004
1042219	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	10 Nov 2004
1065654	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	25 Oct 2006
1093267	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	10 Nov 2008
1127751	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	03 Jun 2011
5269	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	10 Aug 2000
1066270	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	15 Dec 2006
1072508	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	23 Jul 2007
1100623	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	07 Oct 2009
1526064	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	11 Nov 2014

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Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix C Borehole Logs and Monitoring Well Installation Details

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix D Materials Tracking

Material Classification Form (example)

MCF Reference # 1000_____

Completed by	Nathan Cussen
Date	24 July 2015
Material Identification (Stockpile name and grid reference, importation source name and unique identification name etc.)	Type A Soils - Organic Garden Mix from Benedict Industries
Source location (Stockpile name and grid reference, source location and grid reference, off-site source address and description of source site residential, quarry etc.)	On site □ Details: Off site (Source Site) ☒ Details: Stockpile located at Menangle Quarry Benedict Industries, Menangle Road, Menangle, NSW.
JBS&G material classification report reference	JBS&G 1000 Date: 24 July 2015
Summary of material characterisation report as prepared by JBS&G	VENM □ for importation ENM □ Reuse on Site □ Waste Classification □ Other ☒ please describe VENM silty sand blended with recovered fines topsoil, ash, fowl manure and composted organics to be imported to site
Volume of material	Survey Information □ Field Estimate □ Required Quantity (off-site source) ☒ Approximately 65 m^3
Material description (material type, colour, inclusions, etc.)	Type A Organic Garden Mix – brown VENM alluvial silty sand and topsoil blended with recovered fines topsoil, ash, fowl manure and compost organics
Is the material free of ACM, staining and malodourous soils	Yes ☒ No □ Details:
If assessment is of material from an off-site Source, is the material suitable for importation to the site?	Yes, the material is suitable to be imported to site.
If assessment is for off-site disposal of material, what is the final waste classification / reuse exemption conclusion?	N/A
If the assessment is for reuse of the material at the site, is the material suitable for reuse	Suitable for reuse: - below the capping profile in road corridor □ - above the capping profile in road corridor footprint and used in landscaped areas ☒ - below the capping profile in recreational areas □ - above the capping profile in recreational areas and used in landscaped areas ☒ - below the marker layer in Lots 8 and 9 □ - above the marker layer in Lots 8 and 9 and used within landscaped areas ☒ - below the marker layer in Lot 12 □ - above the marker layer in Lot 12 and used within landscaped areas ☒
Other comments:	Please ensure Benedict dockets are retained, the volume imported documented and all materials tracked in accordance with the materials tracking plan.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Material Tracking Sheet Part A (example)

MTS Reference #_____

Materials Tracking Form Part A (Materials Received, Excavated, Stored or Placed)										
Completed by:										
Date:										
Comment (Are there any visual or olfactory indicators of contamination):										
Load No.	**Time**	**Truck Rego / Plant ID**	**Load Quantity (m^3)**	**MCF Reference No**	**Source Location and ID**	**Temporary Stockpiled Y/N and New ID**	**Final Placement Location Y/N**	**Placement location**	**Reduced level of placement m AHD (final placement only)**	**GPS Coordinates (final placement only)**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Material Tracking Sheet Part B (exam

MTS Reference #_____

Part B Off-site Disposal							
Completed by:							
Date:							
Receiving Site:							
Hauling subcontractor:							
Load No.	Time	Truck Rego / Plant ID	Load Quantity (m^3)	Material Classified as waste Y/N	Waste Description and JBS&G Reference No. including any visual or olfactory indicators of contamination	Source location	Receipt/Consignment No.

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Version: 1, Version Date: 14/04/2021

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		Name	Name	Signature	Date
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Version: 1, Version Date: 14/04/2021

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Appendix C Hazardous Materials Building Survey

Document Set ID: 9547379
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Penrith City Council

Hazardous Building Materials Survey

134-144 Henry Street,
42-50 Station Street,
Allen Place Car Park
Penrith, NSW

18 March 2020

58140/127,994 (Rev 0)

JBS&G Australia Pty Ltd

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Version: 1, Version Date: 14/04/2021

Penrith City Council

Hazardous Building Materials Survey

134-144 Henry Street,
42-50 Station Street,
Allen Place Car Park
Penrith, NSW

18 March 2020

58140/127,994 (Rev 0)

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table of Contents

Abbreviations v

1. Introduction 1
   - 1.1 Background 1
   - 1.2 Objectives 1
   - 1.3 Hazardous Materials Survey Limitations 2
2. Methodology 4
   - 2.1 Hazardous Materials 4
     - 2.1.1 Asbestos Containing Materials and Asbestos Containing Dust 4
     - 2.1.2 Lead Based Paint 4
     - 2.1.3 Lead Containing Dust 4
     - 2.1.4 Polychlorinated Biphenyls 4
     - 2.1.5 Synthetic Mineral Fibres 5
   - 2.2 Inaccessible Areas 5
3. Site Description 6
   - 3.1 Property #1 – 134-138 Henry Street 6
     - 3.1.1 Exterior 6
     - 3.1.2 Interior 7
   - 3.2 Property #2 – 140-142 Henry Street 8
     - 3.2.1 Exterior and Arcade 9
     - 3.2.2 Interior 9
   - 3.3 Property #3 – 144 Henry Street 11
     - 3.3.1 Exterior 11
     - 3.3.2 Interior 12
   - 3.4 Property #4 – 42-44 Station Street 12
     - 3.4.1 Funeral Home 13
     - 3.4.2 Garage 14
   - 3.5 Property #5 – 46 Station Street 14
     - 3.5.1 Exterior 14
     - 3.5.2 Interior 15
   - 3.6 Property #6 – 48-50 Station Street 16
4. Results 18
   - 4.1 Hazardous Materials 18
     - 4.1.1 Asbestos Containing Materials 18
     - 4.1.2 Asbestos Containing Dust 19
     - 4.1.3 Lead Containing Dust 20
     - 4.1.4 Lead Based Paints 21

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4.1.5 Polychlorinated Biphenyls....22
4.1.6 Synthetic Mineral Fibres....22
4.2 Inaccessible Areas....22
5. Conclusions and Recommendations....23
5.1 Hazardous Materials....23
5.1.1 Asbestos Containing Materials....23
5.1.2 Lead Containing Dust....24
5.1.3 Lead Based Paints....24
5.1.4 Synthetic Mineral Fibres....25
5.1.5 Polychlorinated Biphenyls....25
5.2 Inaccessible Areas....25
5.3 Unexpected Finds....25
6. Limitations....26

List of Tables

Table 3.1: Accessible Properties....6
Table A: Asbestos Results Summary Table....18
Table B: Asbestos Dust Results Summary Table....19
Table C: Lead Dust Results Summary Table....20
Table D: Lead Paint Results Summary Table....21

List of Figures

Figure 1 Site Location
Figure 2 Site Layout

Appendices

Appendix A Hazardous Materials Register
Appendix B Photographs
Appendix C Laboratory Analysis Reports and Chain of Custody Documentation

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Abbreviations

Term	Definition
AC	Asbestos Cement
ACM	Asbestos Containing Material
ACD	Asbestos Containing Dust
ANZECC	Australian and New Zealand Environment Conservation Council
AMP	Asbestos Management Plan
COC	Chain of Custody
EPA NSW	Environmental Protection Authority, New South Wales
FA	Friable Asbestos
HIL	Health Investigation Levels
HSL	Health Screening Levels
JBS&G	JBS&G Australia Pty Ltd
LAA	Licenced Asbestos Assessor
LCD	Lead Containing Dust
LOR	Limit of Reporting
LP	Lead Paint
NATA	National Association of Testing Authorities, Australia
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
PCB	Polychlorinated Biphenyls
PPE	Personal Protective Equipment
SMF	Synthetic Mineral Fibre
SWA	Safe Work Australia
SWNSW	SafeWork New South Wales
WHS (WH&S)	Workplace Health and Safety

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1. Introduction

1.1 Background

JBS&G Australia Pty Ltd (JBS&G) was engaged by Penrith City Council (Council, the client) to undertake a pre-demolition hazardous building materials survey (HBMS) of the structures located within the proposed Penrith City Village Park (PCVP) redevelopment. It is understood that the client is proposing to develop the western portion of PCVP (herein, referred to as the 'site') for contemporary public open space. The site area is shown on **Figures 1** and **2.** In addition, the address and legal identification of each property within the site is provided in **Table 3.1**.

The properties at the site were in a mixed state of occupancy with two properties completely vacant, two partially vacant with the remaining areas tenanted and occupied, and two/three properties completely tenanted and occupied.

To facilitate the redevelopment of the site, the client is proposing to demolish the existing structures. The client has requested a HBMS prior to the commencement of any demolition works.

This advice presents the outcomes of the inspection undertaken by JBS&G personnel and provides recommendations on requirements for the removal of identified hazardous materials in accordance with regulations and guidance in force at the time of the inspection.

The structures were inspected for the following hazardous materials:

- Asbestos containing materials (ACMs);
- Asbestos containing dust (ACD);
- Lead based paints (LP);
- Lead containing Dust (LCD)
- Synthetic mineral fibres (SMF); and
- Polychlorinated biphenyls (PCB).

No previous hazardous building materials survey reports or registers were made available to JBS&G prior to the completion of these works.

1.2 Objectives

The objective of the HBMS was to determine the presence, quantity and condition of any hazardous materials within the buildings prior to proposed demolition works.

The HBMS and production of this report have been undertaken in accordance with the requirements of:

- *Work Health and Safety Act* (2011);
- *Work Health and Safety Regulation* (2017);
- *How to Safely Remove Asbestos Code of Practice*, SafeWork NSW, (2019) (SWNSW 2019a);
- *How to Manage and Control Asbestos in the Workplace Code of Practice*, SafeWork NSW (2019) (SWNSW 2019b);
- Australian Standard 4361.2 (1998) *Guide to Lead Paint Management - Part 2: Residential and Commercial Buildings* (AS4361.2-1998);
- Australian Standard 4361.2 (2017) *Guide to Hazardous Paint Management - Part 2: Lead Paint in Residential, Public and Commercial Buildings* (AS4361.2-2017);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- National Occupational Health and Safety Commission's *National Standard for Synthetic Mineral Fibres* [NOHSC:1004(1990)];
- National Occupational Health and Safety Commission's *National Code of Practice for the Safe Use of Synthetic Mineral Fibres*, [NOHSC:2006(1990)]; and
- Australian and New Zealand Environment Conservation Council's *Identification of PCB-containing Capacitors: An information booklet for Electricians and Electrical Contractors*, (ANZECC 1997).

1.3 Hazardous Materials Survey Limitations

Whilst all reasonable care has been taken by JBS&G during the completed HBMS, this report is limited due to:

- Only safely accessible areas of the site were surveyed.
- Access restrictions to operational areas such as energised services, gas, air conditioning/heating, pressurised vessels, chemical lines etc.
- Potential materials located in areas in which they could not reasonably be envisaged or anticipated.
- Limited access to internal building components e.g. set floor, walls, ceiling cavities etc., in which case only representative areas were inspected with the hand tools available to the JBS&G consultants for destructive investigation.
- Access restrictions to areas above 3 metres or any area deemed inaccessible without the use of specialised equipment.
- Access to restrictions to areas of structures where the structural integrity for the floor and/or ceiling has been compromised.
- Service pits, confined spaces, voids, cavities within the building structure and internal areas of plant and equipment that could not be safely accessed.

It should be noted that buildings built between the 1930s - 1980s may have general occurrences of ACMs in areas which are not readily accessible with the hand tools available for the survey. These areas and materials include, inter alia:

- Fibre Cement Sheeting (FCS) used as packing to bearers and joists in the underfloor void or as boxing/shuttering to concrete formwork;
- FCS packing between window/door frames and timber studs; and
- Compressed FCS underneath tiled floor areas.

Whilst all care is taken by the consultants to uncover hidden materials, not all areas can be accessed within the allowable timeframe without more industrial (power) tools. As such, only minor destructive sampling techniques were employed to gain access. Consequently, without substantial demolition of the building, it is not possible to guarantee that every source of hazardous material has been detected. JBS&G recommends that areas inaccessible during the survey be inspected as the demolition progresses. If suspected hazardous materials are observed, confirm the presence or absence of hazardous materials through laboratory testing.

In the event suspected hazardous materials are identified during strip out or demolition which are not included in this report, JBS&G recommends that works should cease and an assessment of the materials undertaken by a competent person for further appropriate recommendations.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

No one section or part of a section of this report is to be taken as giving an overall idea of this report. Each section is to be read in conjunction with the whole of this report, including the appendices and attachments.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2. Methodology

2.1 Hazardous Materials

2.1.1 Asbestos Containing Materials and Asbestos Containing Dust

Representative samples of suspected ACMs and ACDs were collected where possible and placed into a zip-lock bags. These were subsequently delivered to a NATA accredited laboratory for analysis using polarised light microscopy in conjunction with dispersion staining techniques. Similar materials to those analysed or other materials known to contain asbestos from the consultant's experience (e.g. Electrical backing boards, corrugated asbestos cement roofs and older fibre cement sheeting) or materials not accessible may also be assumed to contain asbestos as per the relevant Code of Practice.

At the time of inspection, the following details were recorded:

- Location;
- Type of material;
- Accessibility;
- Condition;
- Friability; and
- Volume/dimensions.

2.1.2 Lead Based Paint

Australian Standard AS4361.2 (2017) *Guide to Hazardous Paint Management - Part 2: Lead Paint in Residential, Public and Commercial Buildings* defines lead paints as those in which the lead content (calculated as lead metal) is in excess of 0.1 percent by weight of the dry film. This can be determined by field spot tests, laboratory testing or the use of portable X-ray fluorescence (XRF) field tests. JBS&G utilises XRF technology as a screening tool for the identification of lead based paints in the field. Any detection of lead greater than 0.1 mg/cm^2 was adopted for the assessment of lead based paints for this investigation with representative samples collected where possible and delivered to a NATA accredited laboratory for analysis using inductively coupled plasma optical emission spectrometry (ICP-OES).

2.1.3 Lead Containing Dust

Representative samples of accumulated or settled dust were collected and delivered to a NATA accredited laboratory for analysis via ICP-OES. A conservative assessment criteria was adopted for this investigation given the potential for human exposure and the readily disturbed and uncontained nature of accumulated or settled dust.

Concentrations of lead within accumulated or settled dust were compared against the health investigation level (HIL) for residential sites with garden/accessible soil of 300 mg/kg as outlined in National Environment Protection Measure (NEPC 2013) guidelines.

2.1.4 Polychlorinated Biphenyls

Old fluorescent light fittings and other appliances which may contain capacitors containing PCB dielectric oil are identified by inspection and evaluation with the consultant's experience of similar light fittings and appliances. Alternatively, where possible and when it was safe to do so, a representative light fitting was opened to reveal the capacitor and the make and model recorded to be compared against the ANZECC (1997) list of PCB containing capacitors.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2.1.5 Synthetic Mineral Fibres

SMF containing materials were either sampled as per the asbestos methodology or assumed to contain SMF from the consultant's experience of similar materials.

2.2 Inaccessible Areas

As per SWNSW 2019b, any areas not accessible must be recorded as such. Where hazardous materials are suspected to be contained within inaccessible areas, these shall be documented in this report and the associated Hazardous Materials Register (**Appendix A**).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3. Site Description

The HBMS was conducted on 28 February, 2 March and 3 March 2020 by Stuart Lumsden and Brendan Sinclair, two of JBS&G's experienced hazardous materials surveyors and SafeWork NSW Licensed Asbestos Assessors (LAA 001140 and LAA 001316 respectively).

The site was bound by Henry Street to the north, Gaymark Lane to the east, Allen Place to the south and Station Street to the West. The site comprised seven lots grouped into six properties, with a total of seven structures.

At the time of inspection, the properties were in a mixed state of occupancy with two properties completely vacant, two partially vacant with the remaining areas tenanted and occupied, and two/three properties completely tenanted and occupied.

The property identification number, address, associated lots, number of structures, and hazardous materials identified is summarised in **Table 3.1** with the property identification and location also shown on **Figure 2**.

Table 3.1: Property Summary

Property Identification	Lots	Address	Structures
Property #1	Lot 1 in DP 164798	134-138 Henry Street	One double storey structure
Property #2	Lot 10 and 11 in DP 553665	140-142 Henry Street	One combined single and double storey structure
Property #3	Lot 2 in DP 556075	144 Henry Street	One single storey structure
Property #4	Lot 3 in DP 1200790	42-44 Station Street	Two single storey structures
Property #5	Lot E in DP 163176	46 Station Street	One double storey structure
Property #6	Lot 1 in DP 526304	48-50 Station Street	One single storey structure

The type, location, friability, accessibility and approximate quantities of identified and suspected hazardous materials are provided in the Hazardous Materials Register in **Appendix A**. Photographs taken during the HBMS are presented in **Appendix B**. A summary of the observations made during the HBMS is included in the following sections.

3.1 Property #1 – 134-138 Henry Street

Property #1 comprised a double storey commercial structure and based on available historical aerial imagery, the structure was observed to have been constructed between 1956 and 1965. The ground floor comprised three shops and the first floor consisted of four office suites and a common area comprising a hallway, kitchen, and male and female toilets.

3.1.1 Exterior

The external areas of the building comprised terracotta tile roof, brick walls, and a ground floor awning on the north, east and south façades. The western façade was located within an enclosed and locked access walkway/fire escape between Property #1 and Property #2.

A summary of the significant observations made during the HBMS is as follows:

- Asbestos containing fibre cement sheeting (B1-A07) was identified to the eaves, soffits and ceiling lining to the external stairs. A detached panel from the northern eave was observed on top of the ground floor awning.
- Asbestos containing fibre cement sheeting (B1-A06) was identified to the ceiling lining of ground floor awning. This material was also identified to the upper panels of the door to the external bin area.
- An asbestos containing black bituminous roof membrane (B1-A03) was identified to the rooftop plant area beneath the new grey surface membrane coating.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Asbestos containing fibre cement sheeting (B1-A04) was identified to the wall linings between the rooftop plant area and ceiling cavity.
- A suspected asbestos containing electrical mounting board (EMB) was identified within the electrical cabinet at the top of the external stairs. A sample was unable to be collected due to the supply of live electricity.
- Lead based brown paint (B1-LP04, 0.22% w/w) was identified to the timber fascia panels in the rooftop plant area.
- All remaining external accessible paint systems were screened via XRF. The presence of lead was detected in all paint systems (XRF result for lead > 3.0 mg/cm^2) which exceeds the adopted screening level for this investigation and, therefore, all external paint systems are assumed to comprise lead based paints.
- Fluorescent lights were identified throughout the external areas and are suspected to contain PCB capacitors, however, a detailed inspection was not possible due to the supply of live electricity.
- Two hot water systems were identified within the western external access way and are suspected to contain SMF internal insulation.

3.1.2 Interior

3.1.2.1 Ground Floor

The ground floor comprised three shops and a common staircase providing access to the first floor. Shop 1 comprised the southern portion of the building, Shop 2 comprised the central portion of the building, Shop 3 comprised the central portion of the building, and the common staircase was located between Shop 2 and Shop 3. All three shops were tenanted and occupied at the time of inspection and comprised concrete floors with various floor coverings, combination of cement rendered brick and plaster walls, and plaster ceilings.

A summary of the significant observations made during the HBMS is as follows:

- A suspected asbestos containing fibre cement infill panel was identified above the door to Shop 1.
- A suspected asbestos containing EMB was identified to the electrical cabinet in Shop 2. A sample was unable to be collected due to the supply of live electricity.
- Three suspected asbestos containing EMBs were identified to the electrical cabinet in Shop 3. A sample was unable to be collected due to the supply of live electricity.
- Asbestos containing black fibrous bituminous material within settled dust (B1-AD01) was identified to internal floor surface of the electrical cabinet in Shop 3.
- Non-asbestos containing black and white vinyl flooring (B1-A01) was identified to the main shop floor and office of Shop 3.
- Non-asbestos containing fibre cement infill panels (B1-A02) were identified to the western wall of Shop 3.
- Lead based white paint (B1-LP01, 1.3% w/w) was identified to the internal cement rendered walls of Shop 3. This paint system was also identified to the internal cement rendered walls in Shop 1 and Shop 2.
- Lead based black and white paints (XRF >2.5 mg/kg) were identified to the timber front doors and door frames of Shop 3.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Fluorescent lights were identified throughout the ground floor internal areas and are suspected to contain PCB capacitors, however, a detailed inspection was not possible due to the supply of live electricity.

3.1.2.2 First Floor

The first floor comprised; a common area consisting of a lobby/hallway, a kitchen and male and female toilets; Suite 1 at the southern end of the hallway, Suite 2 and Suite 3 on the eastern side of the hallway opposite the kitchen and toilets, and Suite 4 to the north of the hallway. All suites and common areas comprised concrete or timber floors, a combination of cement rendered brick and plaster walls, and plaster ceilings.

At the time of inspection, Suites 1 and 2 were tenanted, and Suites 3 and 4 were vacant.

A summary of the significant observations made during the HBMS is as follows:

- Asbestos containing fibre cement debris (B1-A05) was identified within the ceiling cavity, adjacent to the access to the rooftop plant area
- A suspected asbestos containing EMB was identified to the electrical cabinet in the kitchen. A sample was unable to be collected due to the supply of live electricity.
- Elevated levels of lead within settled dust above the adopted site criteria (B1-LD01, 540 mg/kg) was identified throughout the ceiling cavity. This dust was found not to contain asbestos (B1-AD02).
- Lead based white paint (B1-LP03, 0.12% w/w) was identified to the timber windows throughout the common areas and suites.
- Non-lead based cream paint (B1-LP02, 0.02% w/w) was identified to the cement rendered walls throughout the common areas and suites 3.
- Fluorescent lights were identified throughout Suite 4 and comprised RIFA Type PHN (6.5 µF capacitance) capacitors. These capacitors are listed in ANZECC 1997 as known to contain PCBs.
- Fluorescent lights were also identified throughout the remaining internal areas and are suspected to contain PCB capacitors, however, a detailed inspection was not possible due to the supply of live electricity.
- A hot water system was identified in the kitchen and is suspected to contain SMF internal insulation.
- Suspected SMF insulation was identified to the operational air conditioning ducting, redundant ducting, and as loose fill insulation throughout the ceiling cavity.
- Suite 2 was tenanted at the time of this inspection and no access was available. Based on observations during the HBMS, the hazardous materials identified in Suites 1, 3, and 4 are also assumed to be present within Suite 2.

3.2 Property #2 – 140-142 Henry Street

Property #2 comprised a combined single and double storey commercial structure with an arcade walkway separating the structure into an eastern portion and a western portion. Based on available historical aerial imagery, the structure was observed to have been constructed between 1965 and 1978. The eastern portion comprised three shops and the western portion comprised seven shops. At the time of inspection, all shops were tenanted and occupied.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.2.1 Exterior and Arcade

The exterior of the building comprised corrugated metal roof, exposed and cement rendered brick walls, corrugated metal fascia cladding. The northern façade of the building comprised brick and glass shop fronts with an awning over the footpath. The Arcade comprised brick and glass shop fronts, concrete floor with ceramic tiles, and a combination of metal slats and plaster ceiling.

A summary of the significant observations made during the HBMS is as follows:

- Asbestos containing fibre cement sheeting (B2-A01) was identified to the external eaves and fascia panelling to the eastern façade of the building. This material is also assumed to be present behind the corrugated metal cladding to the southern façade of the eastern portion and behind the sloped plasterboard ceiling to the eastern side of the Arcade.
- Three large suspected asbestos containing EMBs were identified within the electrical cabinet located in the car parking area. Three smaller EMBs were also located within the electrical cabinet but are not suspected to contain asbestos.
- Suspected asbestos containing fibre cement sheeting was identified to the southern roof parapet of the eastern portion, however, a sample was unable to be collected due to height safety hazards.
- Non-asbestos containing fibre cement sheeting (B2-A02) was identified to the ceiling lining of the northern awning to the eastern portion.
- Non-asbestos containing fibre cement sheeting (B2-A03) was identified to the northern gable panels of the Arcade.
- Non-asbestos containing fibre cement sheeting (B3-A04) was identified to the ceiling lining of the northern awning to the western portion.
- Non-asbestos containing fibre cement sheeting (B3-A05) was identified to the southern eaves to the western portion.
- Non-asbestos containing bituminous material (B3-A03) was identified to the expansion joint in the western façade of the western portion.
- Non-asbestos containing bituminous material (B3-A06) was identified to the expansion joints of the concrete footpath to the southern aspect of the building.
- Non-lead based blue paint (B2-LP01, 0.1% w/w) was identified to the doors and door frames of the toilets to the eastern aspect of the eastern portion.
- All remaining accessible external paint systems were screened via XRF and found not to comprise lead based paint systems (i.e. XRF result <0.1 mg/cm^2)
- Fluorescent lights were identified throughout the external areas and Arcade and are suspected to contain PCB capacitors, however, a detailed inspection was not possible due to the supply of live electricity.
- Suspected SMF insulation was identified to the roof throughout the ceiling cavity of the Arcade.

3.2.2 Interior

3.2.2.1 Eastern Portion

The eastern portion of the property comprised three shops with Shop 1 comprising the northern portion, Shop 2 comprising the central portion, and Shop 3 comprising the southern portion. All three shops were tenanted and occupied at the time of inspection and comprised concrete floors

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

with various floor coverings, combination of cement rendered brick and plaster walls, and plaster suspended ceiling tiles.

A summary of the significant observations made during the HBMS is as follows:

- A suspected asbestos containing EMB was identified within the electrical cabinet of Shop 1.
- Elevated levels of lead within settled dust above the adopted site criteria (B2-LD01, 380 mg/kg) was identified throughout the ceiling cavity of shop 2. This dust was found not to contain asbestos (B2-AD01).
- Non-lead based cream paint (B2-LP02, <0.01% w/w) was identified to the door frames of the Shop 1 toilets.
- All remaining accessible paint systems were screened via XRF and found to comprise non-lead based paint systems (i.e. XRF result <0.1 mg/cm^2).
- Fluorescent lights were identified throughout the internal areas and are suspected to contain PCB capacitors, however, a detailed inspection was not possible due to the supply of live electricity.
- A hot water system was identified in Shop 2 and another was identified within the ceiling cavity above the external male toilet. Both hot water systems are suspected to contain internal SMF insulation.
- Suspected SMF insulation was identified to the roof throughout the ceiling cavity.
- Shop 3 was tenanted at the time of this inspection and no access was available. Based on observations during the HBMS, the hazardous materials identified within Shops 1 and 2 are also assumed to be present within Shop 3.

3.2.2.2 Western Portion

The western portion of the property comprised seven shops with Shops 7 and 8 comprising the northwest portion, Shops 4 and 5 comprising the northeast portion, Shop 6 comprising the central portion, Shop 10 comprising the ground floor southern portion, and Shop 9 comprising the first floor southern portion. All shops were tenanted and occupied at the time of inspection and comprised concrete floors with various floor coverings, combination of cement rendered brick and plaster walls, and a combination of plasterboard ceilings and suspended ceiling tiles.

A summary of the significant observations made during the HBMS is as follows:

- Suspected asbestos containing fibre cement sheeting was identified to the southern cream painted wall within the staff room of Shop 10. This material was also identified to the internal walls of the staff toilets in Shop 10.
- Suspected asbestos containing fibre cement sheeting was identified to skylight walls within the ceiling cavity above the toilets of Shop 9.
- Non-asbestos containing cream vinyl flooring (B3-A01) was identified to the lunch room and hallway of Shop 7/8.
- Non-asbestos containing blue/grey vinyl flooring (B3-A02) was identified to the kitchen and strong room within Shop 9.
- Asbestos containing loose fibre bundles within settled dust (B3-AD02) was identified within the ceiling cavity above Shop 4/5. This material is identified as friable asbestos and is assumed to be present throughout the ground floor ceiling cavity of the western portion. This dust was also found to contain lead concentrations below the adopted site criteria (B3-LD02, 210 mg/kg).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Levels of lead within settled dust below the adopted site criteria (B3-LD01, 120 mg/kg) was identified throughout the ceiling cavity of above Shop 7/8. This dust was found not to contain asbestos (B3-AD01).
- Levels of lead within settled dust below the adopted site criteria (B3-LD03, 140 mg/kg) was identified throughout the ceiling cavity above Shop 6. This dust was found not to contain asbestos (B3-AD03).
- Elevated levels of lead within settled dust above the adopted site criteria (B3-LD04, 680 mg/kg) was identified throughout the ceiling cavity of Shop 9. This dust was also found not to contain asbestos (B3-AD04).
- Non-lead based dark blue paint (B3-LP01, <0.01% w/w) was identified to the doors and door frames of the Shop 7/8 toilets.
- Lead based cream paint (B3-LP02, 0.17% w/w) was identified to the doors and door frames of the Shop 10 toilets.
- All remaining accessible paint systems were screened via XRF and found to comprise non-lead based paint systems (i.e. XRF result <0.1 mg/cm^2).
- Fluorescent lights were identified throughout the internal areas and are suspected to contain PCB capacitors, however, a detailed inspection was not possible due to the supply of live electricity.
- Suspected SMF ceiling tiles were identified to the suspended ceilings of Shop 7/8.
- A hot/cold water system was identified within the kitchen of Shop 7/8 and is suspected to contain internal SMF insulation.
- Suspected SMF insulation was identified to the air conditioning ducting and roof sarking throughout the ceiling cavities.

3.3 Property #3 – 144 Henry Street

Property #3 comprised a single storey commercial structure in the northern portion and an asphalt sealed car park in the southern portion. The structure comprised two shops, with the western portion comprising Shop 1 and the eastern portion comprising Shop 2. Based on available historical aerial imagery, the structure was observed to have been constructed between 1978 and 1986.

3.3.1 Exterior

The external areas of the building comprised corrugated metal roof and a combination of exposed brick and corrugated metal walls. The northern facade of the building comprised brick and glass shop fronts with an awning over the footpath and the southern facade of the building comprised brick walls with a metal gate and car park to the south.

A summary of the significant observations made during the HBMS is as follows:

- A locked electrical cabinet was identified to the southwest corner of the building and is suspected to contain an asbestos containing EMB.
- Non-asbestos containing fibre cement sheeting (B4-A02) was identified to the ceiling lining of the awning.
- All accessible external paint systems were screened via XRF and found not to comprise lead based paint systems (i.e. XRF result <0.1 mg/cm^2)
- No other hazardous materials were identified to the external areas of the building.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.3.2 Interior

3.3.2.1 Shop 1

Shop 1 comprised the western portion of the building with cement rendered brick and plasterboard walls, concrete floors with various floor coverings, and suspended ceiling tiles. At the time of inspection Shop 1 was tenanted consisting of a reception area, store room, treatment rooms, and a kitchen/bathroom area at the southern end of the building.

A summary of the significant observations made during the HBMS is as follows:

- Non-asbestos blue vinyl flooring (B4-A01) was identified to the treatment rooms.
- Levels of lead within settled dust below the adopted site criteria (B4-LD01, 220 mg/kg) was identified throughout the ceiling cavity. This dust was found not to contain asbestos (B4-AD01).
- Lead based blue paint (B4-LP01, 1.2% w/w) was identified to the doors and door frames of the toilets.
- All remaining accessible paint systems were screened via XRF and found not to comprise lead based paint systems (i.e. XRF result <0.1 mg/cm^2)
- Suspected SMF containing ceiling tiles were identified to the suspended ceiling throughout.
- An instant hot water system was identified to the kitchen area and is suspected to contain internal SMF insulation.
- Suspected SMF insulation was identified to the roof sarking throughout the ceiling cavity.
- Fluorescent light fittings were identified throughout but based on their modern age and appearance they are not suspected to contain PCB containing capacitors.

3.3.2.2 Shop 2

Shop 2 comprised the eastern portion of the building with cement rendered brick and plasterboard walls, concrete floors with various floor coverings, and suspended ceiling tiles. At the time of inspection Shop 2 was tenanted consisting of an entry, meeting room, open office area, kitchen and break room area, and a toilet.

A summary of the significant observations made during the HBMS is as follows:

- Levels of lead within settled dust below the adopted site criteria (B4-LD02, 140 mg/kg) was identified throughout the ceiling cavity. This dust was found not to contain asbestos (B4-AD02).
- Non-lead based white paint (B4-LP02, 0.03% w/w) was identified to the doors and door frames of the toilets.
- All remaining accessible paint systems were screened via XRF and found not to comprise lead based paint systems (i.e. XRF result <0.1 mg/cm^2)
- An instant hot water system was identified within the kitchen and is assumed to contain internal SMF insulation.
- Suspected SMF insulation was identified to the roof sarking throughout the ceiling cavity.

3.4 Property #4 – 42-44 Station Street

Property #4 comprised two single storey structures and based on available historical aerial imagery, both structures were observed to have been constructed between 1943 and 1956. The Funeral Home building was located in the central portion of the property and the Garage was located

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

adjacent the eastern boundary of the property. At the time of inspection, the structures were vacant.

3.4.1 Funeral Home

The Funeral Home comprised a single storey structure with a terracotta tile roof, exposed brick external walls, cement rendered brick internal walls, horsehair plasterboard ceilings and timber floors.

Internally, the Funeral Home comprised a number of rooms including a large hall, offices, store rooms, kitchen, toilets, and a bathroom. Constructed within the roof void was a three room attic, accessed by external stairs on the eastern aspect of the building. The attic comprised fibre cement walls, damaged masonite ceiling panels, and timber floors. The northern room of the attic was sealed with plastic and marked with asbestos warning stickers.

A summary of the significant observations made during the HBMS is as follows:

- Asbestos containing fibre cement sheeting (B5-A01) was identified to the eaves, soffits and window soffits.
- Asbestos containing fibre cement sheeting (B5-A04) was identified to the internal walls throughout the attic. This material was also identified to the walls and ceiling to the external stairs and the eastern entry soffit.
- A suspected asbestos containing EMB was identified within the electrical cabinet to the external eastern aspect of the building.
- Suspected asbestos containing fibre cement fragments were identified to the roof space as packing between rafters.
- Asbestos containing red vinyl floor tiles (B5-A05) were identified to the attic bathroom.
- Non-asbestos containing vinyl sheeting with fibrous backing (B5-A06) was identified to the floor of the attic northern room.
- Non-asbestos containing red (B5-A07) and black (B5-A08) cable sheathing was identified to the old redundant electrical wiring within the roof void.
- Elevated levels of lead within settled dust above the adopted site criteria (B5-LD02, 850 mg/kg) was identified to the floor of the attic bathroom. This dust was found not to contain asbestos (B5-AD02).
- Elevated levels of lead within settled dust above the adopted site criteria (B5-LD03, 810 mg/kg) was identified throughout the roof void. This dust was found not to contain asbestos (B5-AD03).
- Lead based white paint (B5-LP01, 3.6% w/w) was identified to exterior eaves and window frames.
- Lead based cream paint (B5-LP04, 0.12% w/w) was identified to exterior window frames.
- Non-lead based blue paint (B5-LP03, 0.08% w/w) was identified to the internal walls of the southern office.
- All remaining accessible paint systems were screened via XRF and found not to comprise lead based paint systems (i.e. XRF result <0.1 mg/cm^2)
- Fluorescent lights were identified to the external areas and are suspected to contain PCB capacitors, however, a detailed inspection was not possible due to the supply of live electricity.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- A hot water system was identified to the external eastern aspect of the building and is suspected to contain internal SMF insulation.

3.4.2 Garage

The Garage comprised a single storey structure with a terracotta roof, exposed brick walls, concrete floors, fibre cement internal partition walls, and Masonite ceilings to the central rooms.

Internally, the Garage comprised a number of rooms including a laundry, store rooms, a cool room, toilet, and parking areas accessed via roller doors.

A summary of the significant observations made during the HBMS is as follows:

- Assumed asbestos containing fibre cement sheeting (similar to B5-A01) was identified to the ceiling of the toilet.
- Non-asbestos containing bituminous roof sarking (B5-A02) was identified throughout.
- Non-asbestos containing fibre cement sheeting (B5-A03) was identified to the internal partition walls.
- Non-asbestos containing window putty (B5-A09) was identified to the external timber windows.
- A suspected asbestos containing EMB was identified to the electrical cabinet within the northern room.
- Elevated levels of lead within settled dust above the adopted site criteria (B5-LD01, 350 mg/kg) was identified to the floor of the northern garage. This dust was found not to contain asbestos (B5-AD01).
- Lead based red paint (B5-LP02, 0.71% w/w) was identified to the exterior guttering and downpipes.
- All remaining accessible paint systems were screened via XRF and found to comprise lead based paint systems (i.e. XRF result >0.1 mg/cm^2)
- Fluorescent lights were identified throughout the internal areas and are suspected to contain PCB capacitors, however, a detailed inspection was not possible due to the supply of live electricity.
- A hot water system was identified within the laundry and is assumed to contain internal SMF insulation.

3.5 Property #5 – 46 Station Street

Property #5 comprised a double storey commercial structure occupying the majority of the property with a concrete sealed car park area and gravel driveway in the eastern portion providing access from Allen Place. Based on available historical aerial imagery, the structure was observed to have been constructed between 1956 and 1965. The building comprised separate ground floor and first floor tenancies. At the time of inspection, the ground floor was vacant, and the first floor was tenanted and occupied.

3.5.1 Exterior

The external areas of the building comprised corrugated metal roof and exposed brick walls. The western façade consisted of a brick and glass shop front with fibre cement fascia panelling above.

A summary of the significant observations made during the HBMS is as follows:

- Non-asbestos containing fibre cement sheeting (B6-A05) was identified to the fascia panels to the western façade.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Suspected asbestos containing fibre cement sheeting was identified to the parapet lining of the ground floor roof.
- Air conditioning ducting was identified to the ground floor roof. Based on its age and appearance, suspected asbestos containing mastic is assumed to be present within the flange joints.
- Non-asbestos containing bituminous expansion joint material (B6-A07) was identified to the eastern concrete car park area.
- Suspected asbestos containing putty was identified to the aluminium framed windows throughout. A sample was unable to be collected without damaging or breaking the windows.
- Lead based white paint (B6-LP02, 0.39% w/w) was identified to the metal pole to the eastern concrete stairs.
- All remaining accessible external paint systems were screened via XRF and found to comprise non-lead based paint systems (i.e. XRF result <0.1 mg/cm^2).

3.5.2 Interior

3.5.2.1 Ground Floor

The ground floor tenancy comprised concrete floors with various floor coverings, concrete and plaster ceilings, and cement rendered brick and plasterboard internal walls. The western portion comprised the main shop floor and a strong room and the eastern portion comprised toilets, bathroom, store rooms and offices, and a kitchen. The ground floor also comprised a separate corridor and stairs providing access to the first floor from Station Street.

A summary of the significant observations made during the HBMS is as follows:

- A suspected asbestos containing EMB was identified within the electrical cupboard in the access corridor to the first floor.
- Asbestos containing fibre cement sheeting (B6-A06) was identified to the lining of the electrical cupboard in the access corridor to the first floor.
- Non-asbestos containing grey vinyl tiles (B6-A01) was identified to the floor of the strong room.
- Non-asbestos containing cream vinyl flooring (B6-A02) was identified to the eastern office.
- Non-asbestos containing red vinyl flooring (B6-A03) was identified to the kitchen.
- Asbestos containing fibre cement sheeting (B6-A04) was identified to the ceilings of the two kitchen cupboards. This material was also identified to the ceiling of the shower and cupboard above the shower.
- Non-lead based purple paint (B6-LP01, 0.06% w/w) was identified to doors and door frames of the toilets.
- All remaining accessible paint systems were screened via XRF and found to comprise non-lead based paint systems (i.e. XRF result <0.1 mg/cm^2).
- Fluorescent lights were identified throughout the ground floor and are suspected to contain PCB capacitors, however, a detailed inspection was not possible due to the supply of live electricity.
- A hot water system was identified within the cupboard above the shower and is suspected to contain internal SMF insulation.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.5.2.2 First Floor

The first floor tenancy comprised timber floors with various floor coverings, plaster ceilings, and cement rendered brick, plasterboard and timber internal walls. The first floor comprised offices, waiting areas and a kitchen. Male and female toilets were located in the eastern portion comprising exposed brick walls, concrete floor and plaster ceilings.

A summary of the significant observations made during the HBMS is as follows:

- Suspected asbestos containing fibre cement sheeting was identified to the ceilings of the toilet corridor.
- Asbestos containing weathered fibre cement fragments within settled dust (B6-AD01) was identified within the ceiling cavity. This material is classified as friable asbestos and is assumed to be present throughout the ceiling cavity.
- Elevated levels of lead within settled dust above the adopted site criteria (B6-LD01, 1300 mg/kg) was also identified throughout the ceiling cavity.
- Non-lead based white paint (B6-LP03, 0.05% w/w) was identified to cabinet in the female toilet.
- Non-lead based brown paint (B6-LP04, 0.04% w/w) was identified to walls of the male and female toilets.
- Non-lead based cream paint (B6-LP05, 0.04% w/w) was identified to walls of the eastern office.
- All remaining accessible paint systems were screened via XRF and found to comprise non-lead based paint systems (i.e. XRF result <0.1 mg/cm^2).
- Fluorescent lights were identified throughout the first floor and are suspected to contain PCB capacitors, however, a detailed inspection was not possible due to the supply of live electricity.
- A hot water system was identified within the kitchen and is suspected to contain internal SMF insulation.
- Suspected SMF insulation batts were also identified throughout the ceiling cavity.

3.6 Property #6 – 48-50 Station Street

Property #6 comprised a single storey commercial structure with a corrugated metal roof, exposed brick walls, concrete floor with various floor coverings, and plaster suspended ceiling tiles. Based on available historical aerial imagery, the structure was observed to have been constructed in the between 1956 and 1965.

Internally, the structure consisted of a large main room, small electrical room in the northwest corner, and toilets and office in the central southern portion. At the time of inspection, the structure was vacant.

A summary of the significant observations made during the HBMS is as follows:

- Asbestos containing fibre cement fragments (B7-A01) were identified to the floor of the main room. These fragments were located in the central portion directly below an open ceiling tile.
- Asbestos containing fibre cement fragments (B7-A02) were identified throughout the ceiling cavity. The ACM fragments were observed to comprise a both flat and moulded fibre cement material.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Non-asbestos containing compressed fibre cement sheeting (B7-A03) were identified to the western façade fascia panels.
- Asbestos containing fibre cement sheeting (B7-A04) was identified to the ceilings of the toilets.
- A suspected asbestos containing EMB was identified within the electrical room.
- The pipework associated with the sprinkler system within the electrical room and ceiling cavity was labelled as installed in 1960. Based on the age of the pipework, suspected asbestos containing gaskets are assumed to be present to the flange joints of the pipework.
- Asbestos containing loose fibre bundles within settled dust (B7-AD01) was identified within the ceiling cavity. This material is classified as friable asbestos and is assumed to be present throughout the ceiling cavity. This dust was also found to contain elevated levels of lead above the adopted site criteria (B7-LD01, 770 mg/kg).
- Asbestos containing loose fibre bundles within settled dust (B7-AD02) was identified to the floor of the electrical room. This material is classified as friable asbestos and is potentially present throughout the internal areas of the structure. This dust was also found to contain elevated levels of lead above the adopted site criteria (B7-LD02, 1300 mg/kg).
- Non-asbestos containing bituminous material (B7-A05) was identified to the expansion joints in the external southern wall.
- Non-asbestos containing bituminous material (B7-A06) was identified to the expansion joints in the concrete footpath to the southern aspect of the building.
- Lead based maroon paint (B7-LP01, 0.16% w/w) was identified to the doors of the toilets.
- Lead based paint (B7-LP02, 0.89% w/w) was identified to steel framework of the roof (Note – this sample was reported as sample B2-LD02 within the laboratory analysis report included as **Appendix C**).
- All remaining accessible paint systems were screened via XRF and found to comprise non-lead based paint systems (i.e. XRF result <0.1 mg/cm^2).
- An instant hot water system was identified in the toilet and is suspected to contain internal SMF insulation.
- Suspected SMF insulation was identified to the air conditioning ducting and roof sarking throughout the ceiling cavity.
- Fluorescent lights were identified throughout and are suspected to contain PCB capacitors, however, a detailed inspection was not possible due to the supply of live electricity.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4. Results

4.1 Hazardous Materials

All identified hazardous materials are recorded in the Hazardous Materials Register in **Appendix A** with relevant photographs in **Appendix B**. NATA accredited laboratory analysis reports and chain of custody are provided in **Appendix C**.

4.1.1 Asbestos Containing Materials

ACM were identified by testing at an accredited NATA laboratory and/or visual inspection using the experience of the hazardous materials surveyor. A summary of the results of laboratory testing for asbestos are provided in **Table A** below.

Table A: Asbestos Results Summary Table

Sample ID	Lab ID	Sample Location	Results	Observed Condition
Property #1				
B1-A01	20-Ma03541	Shop 3, floor - Black and white vinyl tile	No Asbestos Detected	N/A
B1-A02	20-Ma03542	Shop 3, western wall, infill panels - Fibre cement sheeting	No Asbestos Detected	N/A
B1-A03	20-Ma03543	External, rooftop plant area, floor - Black bituminous membrane	**Chrysotile and Amosite Asbestos**	Non-Friable
B1-A04	20-Ma03544	External, rooftop plant area, walls - Fibre cement sheeting	**Chrysotile Asbestos**	Non-Friable
B1-A05	20-Ma03545	Ceiling cavity - Fibre cement debris	**Chrysotile Asbestos**	Non-Friable
B1-A06	20-Ma03546	External, Ground floor awning - Fibre cement sheeting	**Chrysotile Asbestos**	Non-Friable
B1-A07	20-Ma03547	External, eaves and soffits - Fibre cement sheeting	**Chrysotile, Amosite and Crocidolite Asbestos**	Non-Friable
Property #2				
B2-A01	20-Ma03548	External, Eastern Portion, eaves and fascia - Fibre cement sheeting	**Chrysotile and Amosite Asbestos**	Non-Friable
B2-A02	20-Ma03549	External, Eastern Portion, north awning - Fibre cement sheeting	No Asbestos Detected	N/A
B2-A03	20-Ma03550	External, north gables to Arcade - Fibre cement sheeting	No Asbestos Detected	N/A
B3-A01	20-Ma03551	Shop 7/8, lunch room and hallway, floor - Cream vinyl	No Asbestos Detected	N/A
B3-A02	20-Ma03552	Shop 9, kitchen/lunch room and hallway, floor - Blue/grey vinyl	No Asbestos Detected	N/A
B3-A03	20-Ma03553	External, Western Portion, west façade, expansion joint – Bituminous material	No Asbestos Detected	N/A
B3-A04	20-Ma03554	External, Western Portion, north awning - Fibre cement sheeting	No Asbestos Detected	N/A
B3-A05	20-Ma03555	External, Western Portion, south eaves - Fibre cement sheeting	No Asbestos Detected	N/A
B3-A06	20-Ma03556	External, Western Portion, south footpath, expansion joint – Bituminous material	No Asbestos Detected	N/A
Property #3				
B4-A01	20-Ma03557	Unit 1, treatment rooms, floor - Blue vinyl	No Asbestos Detected	N/A
B4-A02	20-Ma03558	External, north awning - Fibre cement sheeting	No Asbestos Detected	N/A
Property #4				
B5-A01	20-Ma03559	Funeral Home, eaves and soffits - Fibre cement sheeting	**Chrysotile and Amosite Asbestos**	Non-Friable
B5-A02	20-Ma03560	Garage, roof sarking - Bituminous sarking	No Asbestos Detected	N/A
B5-A03	20-Ma03561	Garage, internal partition walls - Fibre cement sheeting	No Asbestos Detected	N/A
B5-A04	20-Ma03562	Funeral Home, attic walls - Fibre cement sheeting	**Chrysotile and Amosite Asbestos**	Non-Friable

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Sample ID	Lab ID	Sample Location	Results	Observed Condition
B5-A05	20-Ma03563	Funeral Home, attic, bathroom, floor - Red vinyl tiles	**Chrysotile Asbestos**	Non-Friable
B5-A06	20-Ma03564	Funeral Home, attic, north room, floor - Vinyl sheet with fibrous backing	No Asbestos Detected	N/A
B5-A07	20-Ma03565	Funeral Home, first floor, roof void, redundant electrical wiring - Red cable sheath	No Asbestos Detected	N/A
B5-A08	20-Ma03566	Funeral Home, first floor, roof void, redundant electrical wiring - Black cable sheath	No Asbestos Detected	N/A
B5-A09	20-Ma03567	Garage, exterior, windows - Putty	No Asbestos Detected	N/A
Property #5				
B6-A01	20-Ma03568	Ground floor, strong room, floor - Grey vinyl tiles	No Asbestos Detected	N/A
B6-A02	20-Ma03569	Ground floor, east office, floor - Cream vinyl	No Asbestos Detected	N/A
B6-A03	20-Ma03570	Ground floor, kitchen/break room, floor - Red vinyl	No Asbestos Detected	N/A
B6-A04	20-Ma03571	Ground floor, kitchen/break room, cupboards, ceiling - Fibre cement sheeting	**Chrysotile, Amosite and Crocidolite Asbestos**	Non-Friable
B6-A05	20-Ma03572	Exterior, west fascia panels - Fibre cement sheeting	No Asbestos Detected	N/A
B6-A06	20-Ma03583	Ground floor, access corridor to first floor, electrical cabinet, cabinet lining - Fibre cement sheeting	**Chrysotile and Amosite Asbestos**	Non-Friable
B6-A07	20-Ma03584	Exterior, east parking area, expansion joint – Bituminous material	No Asbestos Detected	N/A
Property #6				
B7-A01	20-Ma03585	Floor - Fibre cement fragments	**Chrysotile and Crocidolite Asbestos**	Non-Friable
B7-A02	20-Ma03586	Ceiling cavity - Fibre cement fragments	**Chrysotile, Amosite and Crocidolite Asbestos**	Non-Friable
B7-A03	20-Ma03587	Exterior, west fascia panels - Fibre cement sheeting	No Asbestos Detected	N/A
B7-A04	20-Ma03588	Toilets, ceiling - Fibre cement sheeting	**Chrysotile, Amosite and Crocidolite Asbestos**	Non-Friable
B7-A05	20-Ma03589	Exterior, south wall, expansion joint – Bituminous material	No Asbestos Detected	N/A
B7-A06	20-Ma03618	Exterior, footpath, expansion joint – Bituminous material	No Asbestos Detected	N/A

4.1.2 Asbestos Containing Dust

Representative dust samples were collected throughout the site. A summary of the results of the laboratory testing for asbestos are provided in **Table B** below:

Table B: Asbestos Dust Results Summary Table

Sample ID	Lab ID	Sample Location	Results	Observed Condition
Property #1				
B1-AD01	20-Ma03619	Ground floor, Shop 3, electrical cabinet - Settled dust	**Chrysotile Asbestos**	Friable
B1-AD02	20-Ma03620	Ceiling cavity - Settled dust	No Asbestos Detected	N/A
Property #2				
B2-AD01	20-Ma03621	Shop 2, ceiling cavity - Settled dust	No Asbestos Detected	N/A
B3-AD01	20-Ma05678	Shop 7, ceiling cavity - Settled dust	No Asbestos Detected	N/A
B3-AD02	20-Ma03622	Shop 4/5, ceiling cavity - Settled dust	**Chrysotile asbestos detected in the form of loose fibre bundles**	Friable
B3-AD03	20-Ma03623	Shop 6, ceiling cavity - Settled dust	No Asbestos Detected	N/A

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Sample ID	Lab ID	Sample Location	Results	Observed Condition
B3-AD04	20-Ma03624	Shop 9, ceiling cavity - Settled dust	No Asbestos Detected	N/A
Property #3				
B4-AD01	20-Ma03625	Unit 1, ceiling cavity - Settled dust	No Asbestos Detected	N/A
B4-AD02	20-Ma03626	Unit 2, ceiling cavity - Settled dust	No Asbestos Detected	N/A
Property #4				
B5-AD01	20-Ma03627	Garage, northern room, floor - Settled dust	No Asbestos Detected	N/A
B5-AD02	20-Ma03628	Funeral Home, first floor, bathroom, floor - Settled dust	No Asbestos Detected	N/A
B5-AD03	20-Ma03629	Funeral Home, roof void - Settled dust	No Asbestos Detected	N/A
Property #5				
B6-AD01	20-Ma03630	First floor, ceiling cavity - Settled dust	**Chrysotile asbestos detected in the form of loose fibre bundles**	Friable
Property #6				
B7-AD01	20-Ma03631	Ceiling cavity - Settled dust	**Chrysotile asbestos detected in the form of loose fibre bundles**	Friable
B7-AD02	20-Ma03632	Electrical room, floor - Settled dust	**Crocidolite asbestos detected in the form of loose fibre bundles**	Friable

4.1.3 Lead Containing Dust

Representative dust samples were collected throughout the site. A summary of the results of the laboratory testing for lead are provided in **Table C** below:

Table C: Lead Dust Results Summary Table

Sample ID	Lab ID	Sample Location	Results	Observed Condition
Property #1				
B1-LD01	20-Ma03633	Ceiling cavity - Settled dust	**540 mg/kg**	Friable
Property #2				
B2-LD01	20-Ma03634	Shop 2, ceiling cavity - Settled dust	**380 mg/kg**	Friable
B3-LD01	20-Ma03635	Shop 7, ceiling cavity - Settled dust	120 mg/kg	N/A
B3-LD02	20-Ma03636	Shop 4/5, ceiling cavity - Settled dust	210 mg/kg	N/A
B3-LD03	20-Ma03637	Shop 6, ceiling cavity - Settled dust	140 mg/kg	N/A
B3-LD04	20-Ma03638	Shop 9, ceiling cavity - Settled dust	**680 mg/kg**	Friable
Property #3				
B4-LD01	20-Ma03639	Unit 1, ceiling cavity - Settled dust	220 mg/kg	N/A
B4-LD02	20-Ma03640	Unit 2, ceiling cavity - Settled dust	140 mg/kg	N/A
Property #4				
B5-LD01	20-Ma03641	Garage, northern room, floor - Settled dust	**350 mg/kg**	Friable
B5-LD02	20-Ma03642	Funeral Home, first floor, bathroom, floor - Settled dust	**850 mg/kg**	Friable
B5-LD03	20-Ma03643	Funeral Home, roof void - Settled dust	**810 mg/kg**	Friable
Property #5				
B6-LD01	20-Ma03644	First floor, ceiling cavity - Settled dust	**1300 mg/kg**	Friable
Property #6				
B7-LD01	20-Ma03645	Ceiling cavity - Settled dust	**770 mg/kg**	Friable
B7-LD02	20-Ma03646	Electrical room, floor - Settled dust	**1300 mg/kg**	Friable

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4.1.4 Lead Based Paints

Representative paint samples were collected throughout the building for laboratory testing. A summary of the results of laboratory testing for lead are provided in **Table D** below.

Table D: Lead Paint Results Summary Table

Sample ID	Lab ID	Sample Location	Results	Observed Condition
Property #1				
B1-LP01	20-Ma03647	Ground floor, Shop 3, walls - White paint	**Lead based paint (1.3% w/w)**	Good
B1-LP02	20-Ma03648	First floor, walls - Cream paint	Non-lead based paint (0.02% w/w)	N/A
B1-LP03	20-Ma03649	First floor, window frames - White paint	**Lead based paint (0.12% w/w)**	Good
B1-LP04	20-Ma03650	Roof, fascia - Brown paint	**Lead based paint (0.22% w/w)**	Poor
Property #2				
B2-LP01	20-Ma03651	External, Eastern Portion, toilet doors and door frames - Blue paint	Non-lead based paint (0.10% w/w)	N/A
B2-LP02	20-Ma03652	Shop 1, toilets door frames - Cream paint	Non-lead based paint (0.01% w/w)	N/A
B3-LP01	20-Ma03653	Shop 7/8, toilets door frames - Dark blue paint	Non-lead based paint (0.01% w/w)	N/A
B3-LP02	20-Ma03654	Shop 10, toilet door frames - Cream paint	**Lead based paint (0.17% w/w)**	Good
B3-LP03	20-Ma03655	Shop 9, toilet door frames - Blue/green paint	Non-lead based paint (0.06% w/w)	N/A
Property #3				
B4-LP01	20-Ma03656	Unit 1, toilet door and door frames - Blue paint	Non-lead based paint (0.04% w/w)	N/A
B4-LP02	20-Ma03657	Unit 2, toilet door and door frames - White paint	Non-lead based paint (0.03% w/w)	N/A
Property #4				
B5-LP01	20-Ma03658	Funeral Home, exterior eaves, windows and door frames - White paint	**Lead based paint (3.6% w/w)**	Fair
B5-LP02	20-Ma03659	Garage, exterior, gutters and downpipes - Red paint	**Lead based paint (0.71% w/w)**	Fair
B5-LP03	20-Ma03660	Funeral Home, south office, walls - Blue paint	Non-lead based paint (0.08% w/w)	N/A
B5-LP04	20-Ma03661	Funeral Home, western exterior, window frames - Cream paint	**Lead based paint (0.12% w/w)**	Fair
Property #5				
B6-LP01	20-Ma03662	Ground floor, toilets, doors and door frames - Purple paint	Non-lead based paint (0.06% w/w)	N/A
B6-LP02	20-Ma03663	Exterior, east stairs to first floor, metal pole - White paint	**Lead based paint (0.12% w/w)**	Fair
B6-LP03	20-Ma03664	First floor, female toilet, cabinet - White paint	Non-lead based paint (0.05% w/w)	N/A
B6-LP04	20-Ma03665	First floor, male and female toilet, walls - Brown paint	Non-lead based paint (0.04% w/w)	N/A
B6-LP05	20-Ma03666	First floor, east office, walls - Cream paint	Non-lead based paint (0.04% w/w)	N/A
Property #6				
B7-LP01	20-Ma03667	Toilets, door and door frame -Maroon paint	**Lead based paint (0.16% w/w)**	Good
B7-LP02 (reported as B2-LD02 in Appendix C)	20-Ma05679	Ceiling cavity, steel framework to roof – Red paint	**Lead based paint (0.89% w/w)**	Fair

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4.1.5 Polychlorinated Biphenyls

PCB containing capacitors were confirmed to be present to the fluorescent lights in Suite 4 of Property #1. Detailed inspection of capacitors in all other light fittings could not be undertaken due to the electricity supply to the fittings being active. Therefore, PCB containing capacitors are assumed to be present within all light fittings throughout the site.

4.1.6 Synthetic Mineral Fibres

Suspected SMF materials were identified in various forms throughout the site. Full details of all identified SMF materials are provided in the Hazardous Materials Register (**Appendix A**). The typical forms of SMF identified are summarised below:

- Internal insulation to hot water systems;
- Insulation to roof sarking within ceiling cavities; and
- Insulation to air conditioning ducting.

4.2 Inaccessible Areas

There is potential for additional hazardous materials to be contained within inaccessible areas of the site as outlined in the following points:

- Property #1, Suite 2 – This tenancy was locked and unable to be accessed at the time of inspection.
- Property #2, Shop 3 – This tenancy was locked and unable to be accessed at the time of inspection.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5. Conclusions and Recommendations

Based on the scope of this assessment and with reference to the limitations included in **Section 6**, the following conclusions are made with respect to the Hazardous Materials Survey completed.

5.1 Hazardous Materials

Identified and suspected hazardous building materials were observed throughout the site as a result of visual identification and laboratory analysis. A number of the identified hazardous building materials present a significant exposure risk to current and future site occupants, maintenance workers/contractors and demolition workers if they are not appropriately managed/removed. It is recommended that a hazardous materials management plan be prepared for the site detailing the procedures for the management and removal of the identified hazardous materials to be implemented prior to and for the duration of the proposed demolition works.

The following broad recommendations are made for the removal of the identified hazardous materials to potentially mitigate harmful effects as a result of the proposed works program. Further detail on the appropriate removal and management methods for identified and suspected hazardous building materials shall be included in the site hazardous materials management plan. The person with management or control of the site, must ensure so far as is reasonably practicable that the identified hazardous materials are removed prior to the commencement of the proposed demolition works.

The identified and suspected hazardous materials are presented in the Hazardous Materials Register included as **Appendix A**.

5.1.1 Asbestos Containing Materials

5.1.1.1 Friable Asbestos Containing Dusts

Friable asbestos impacted dusts have been identified within the ceiling cavities of Property #2 (Western Portion) and Property #5 as well as to the ceiling cavity and internal areas of Property #6. Prior to the commencement of any demolition works it is recommended that the following work is undertaken:

- Access to the ceiling cavities of Property #2 (Western Portion) and Property #5, and the entirety of Property #6 shall be immediately restricted and appropriate asbestos warning signage installed to access/egress points to inform personnel of the known asbestos hazards for the interim period and until asbestos removal works can be completed.

  In the event that access to these areas is required, care should be taken to avoid any activities that may disturb the identified friable asbestos hazards. Personal protective equipment (PPE) shall be adopted to preclude potential inhalation exposures to dusts, including – as a minimum – P2 half face respirators and disposable coveralls worn by any persons who require to enter the friable ACD impacted areas, with appropriate decontamination procedures implemented when exiting the identified friable ACD impacted areas.

- The identified friable ACD hazards will be disturbed as part of the proposed demolition works and must therefore be appropriately removed by a Class A licensed asbestos removal contractor in accordance with the requirements of *Work Health and Safety Act (*2011), *Work Health and Safety Regulation* (2017) and SWNSW 2019a prior to any demolition works commencing. An asbestos removal control plan is to be developed by the engaged Class A licensed asbestos removalist prior to the removal works, outlining the specific removal methodologies and control measures necessary to minimise any risk from exposure to asbestos.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- A permit to remove friable asbestos application shall be submitted to SafeWork NSW by the engaged Class A contractor prior to works commencing. No asbestos removal works may commence until receipt of the approved friable asbestos removal work permit from SafeWork NSW.
- Asbestos waste and asbestos impacted waste materials shall be disposed of to an appropriately licensed landfill in accordance with the *Waste Classification Guidelines Part 1: Classifying Waste* (NSW EPA, 2014).
- Air monitoring is required to be conducted during the removal of the friable asbestos impacted dusts and following their completion (clearance monitoring, see **Section 5.1.1.3**) by an independent Licensed Asbestos Assessor (LAA).

5.1.1.2 Non-Friable Asbestos Containing Materials

Non-friable ACM has been identified in various forms throughout the site. Prior to the demolition of the structures it is recommended that the following work is undertaken in conjunction with the friable ACD removal works detailed in **Section 5.1.1.1** above:

- A Class A licensed asbestos removalist shall be engaged to remove all asbestos containing materials as identified in the Hazardous Materials Register (**Appendix A**). Removal and disposal of non-friable asbestos materials shall be undertaken in accordance with the *Work Health and Safety Act (*2011), *Work Health and Safety Regulation* (2017) and SWNSW 2019a.
- While not mandatory during the removal of non-friable ACM, it is considered best practice that asbestos air monitoring is also undertaken by the independent LAA during all non-friable asbestos removal works, given the amount of friable ACD identified throughout the site.

5.1.1.3 Clearance Certification

- Following completion of friable and/or non-friable asbestos removal works within each structure, a clearance inspection shall be undertaken by the independent LAA to ensure that the all asbestos containing materials identified in the Hazardous Materials Register (**Appendix A**) have been removed to a satisfactory industry standard.
- Clearance air monitoring is required to be undertaken as part of the clearance inspection following the removal of the friable asbestos hazards. The results of the clearance air monitoring will form part of the clearance certification.
- Following the completion of the clearance inspection, a clearance certificate shall be issued by the LAA to confirm that the identified non-friable asbestos hazards and/or friable asbestos hazards have been successfully removed and that each structure is suitable for proposed demolition or refurbishment works to commence.

5.1.2 Lead Containing Dust

Elevated levels of lead in dust above the adopted site criteria were identified at the site. A suitably experienced hazardous materials removal contractor should be engaged to remove the lead containing dust in accordance with the AS4361.2-2017 prior to the commencement of any demolition works. It is anticipated that the majority of the lead dust hazards will be removed in conjunction with the friable ACD removal works outlined in **Section 5.1.1.1**.

5.1.3 Lead Based Paints

The lead based paints, as identified in Hazardous Materials Register (**Appendix A**), ranged in condition from good to poor and should be managed in accordance with the AS4361.2-2017. Where peeling or deteriorated they should be removed under controlled conditions by an experienced contractor prior to demolition works. Stable lead based paints adhered to building fabric can be

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

removed as general solid waste provided care is taken to minimise any potential for paint flakes to be dispersed onto ground surfaces.

5.1.4 Synthetic Mineral Fibres

The synthetic mineral fibres encountered during this inspection were generally contained and deemed to be low risk. These SMF materials can be removed with the building and demolition waste with care taken not to generate fibres. Appropriate PPE is recommended including the use of P2 respirator as minimum and appropriate removal methodology as outlined in [NOHSC: 1004(1990)] and [NOHSC: 2006(1990)].

5.1.5 Polychlorinated Biphenyls

The identified PCB containing light fittings within Suite 4 of Property #1 should be removed and disposed of as Scheduled Waste. All other fluorescent light fittings throughout the site should also be removed and disposed of as Scheduled Waste or re-inspected once isolated from the electrical system to confirm the presence or absence of PCB capacitors.

5.2 Inaccessible Areas

Areas inaccessible during the current HBMS should be inspected by a suitably qualified competent person prior to any works commencing. Suspected ACM should be sampled by a suitably qualified competent person prior to any works commencing.

5.3 Unexpected Finds

Any materials deemed to be consistent with those detailed in the Hazardous Materials Register that have not been previously identified should be assumed to have the same content and be treated accordingly.

Should any additional suspected hazardous materials be observed during or prior to demolition works, works should cease until a suitably qualified occupational hygienist can assess the suspected hazardous material and provide appropriate recommendations for management and/or removal.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquiries.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

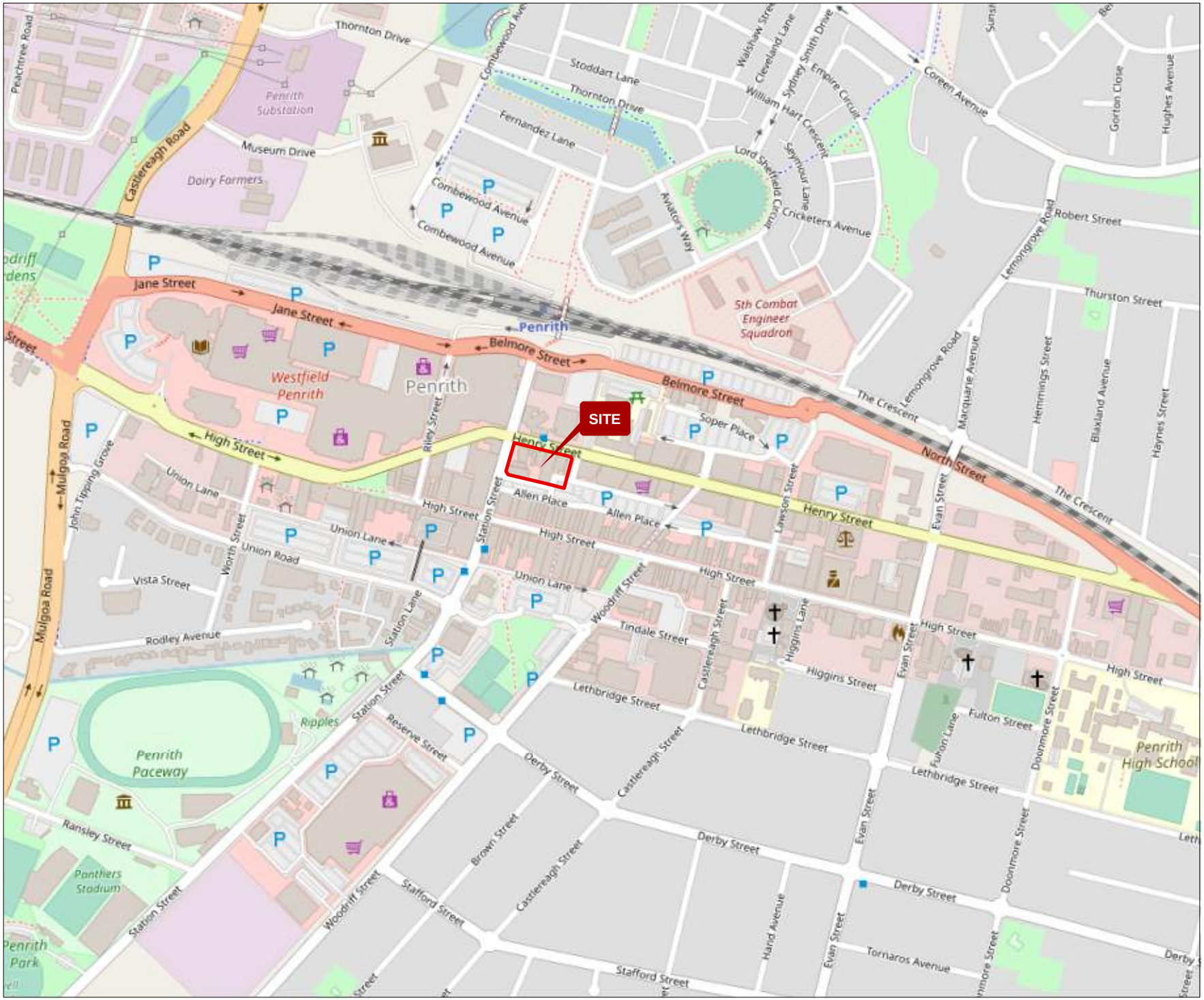
Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figures

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



Legend:

Approximate Site Boundary

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R01 Rev A	Date: 07-Feb-2020
Drawn By: RF	Checked By: CB

Scale 1:8,500

0 100 200

metres

Coor. Sys. GDA 1994 MGA Zone 56

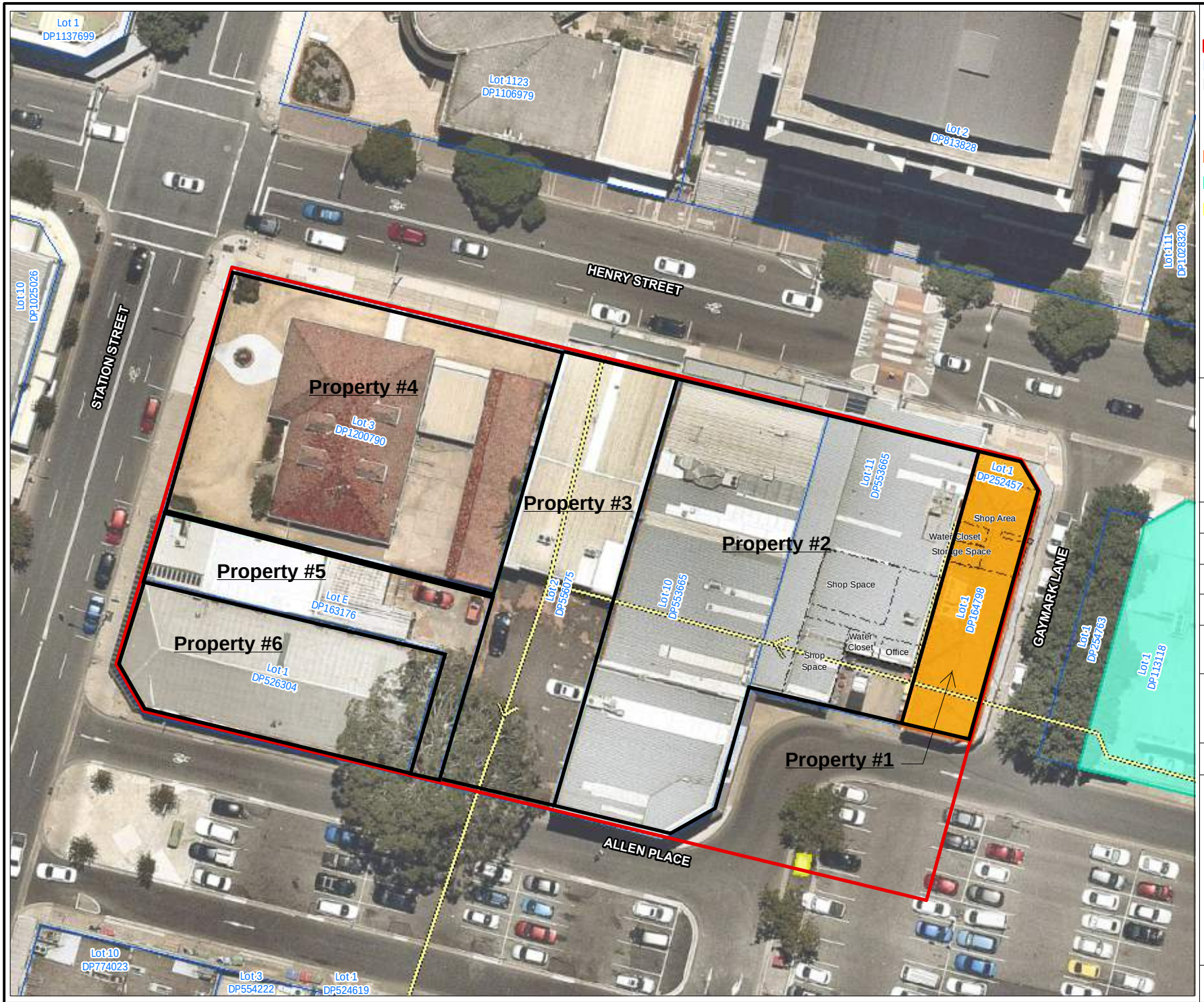
420-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SITE LOCATION

FIGURE 1

Reference: © OpenStreetMap (and) contributors, CC-BY-SA

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



Legend:

- Approximate Site Boundary
- Cadastre (NSW LPI, 2019)
- Site Features Polygon
- Sewerage Infrastructure / Preferential Pathway

Areas of Environmental Concern

- AEC 1- Dry Cleaners Location
- AEC 2- Former Service Station Location
- Transformer

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R01 Rev A	Date: 07-Feb-2020
Drawn By: RF	Checked By: CB

Scale 1:600

0 7.5 15
metres

Coor. Sys. GDA 1994 MGA Zone 56

420-50 Station Street
134 - 144 Henry Street and
Part Henry Street Carpark,
Penrith, NSW

SITE LAYOUT

FIGURE 2

Reference: Near Map www.nearmap.com, imagery date 20-01-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix A Hazardous Materials Register

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Hazardous Materials Register (Rev 0)
Penrith City Village Park
Property #1 – 134-138 Henry Street, Penrith
Date of Production – 18 March 2020

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
Asbestos Containing Materials (ACM)											
B1-A03	Rooftop plant area, floor, beneath new grey membrane	Black bituminous membrane	2	Yes	Non-Friable	**Chrysotile and Amosite Asbestos**	Good	10 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
B1-A04	Rooftop plant area, walls	Fibre cement sheeting	3	Yes	Non-Friable	**Chrysotile Asbestos**	Good	10 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
B1-A05	Ceiling cavity	Fibre cement debris	4	Yes	Non-Friable	**Chrysotile Asbestos**	Poor	<1 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
B1-A06	Awning, ceiling lining	Fibre cement sheeting	5	Yes	Non-Friable	**Chrysotile Asbestos**	Good	50 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
As per B1-A06	External bin area, upper door panels	Fibre cement sheeting	-	Yes	Non-Friable	**Chrysotile Asbestos**	Good	2 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
B1-A07	Eaves, soffits and ceiling lining to external stairs	Fibre cement sheeting	6	Yes	Non-Friable	**Chrysotile, Amosite and Crocidolite Asbestos**	Good	50 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
-	Top of external stairs, electrical cabinet	Electrical mounting board	7	Yes	Non-Friable	**Assumed Asbestos**	Good	1 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
-	Ground floor, Shop 1, infill panel above front door	Fibre cement sheeting	-	Yes	Non-Friable	**Assumed Asbestos**	Good	1 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
-	Ground floor, Shop 2, electrical cabinet	Electrical mounting board	-	Yes	Non-Friable	**Assumed Asbestos**	Good	1 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
-	Ground floor, Shop 3, electrical cabinet	Electrical mounting boards	8	Yes	Non-Friable	**Assumed Asbestos**	Good	3 boards	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
-	First floor, kitchen, electrical cabinet	Electrical mounting board	-	Yes	Non-Friable	**Assumed Asbestos**	Good	1 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
Asbestos Containing Dust (ACD)											
B1-AD01	Ground floor, Shop 3, electrical cabinet	Accumulated dust	8	Yes	Friable	**Chrysotile Asbestos in black fibrous bituminous material**	Poor	1 m²	Restrict general access to the area. Remove prior to demolition. Works to be completed under controlled conditions by Class A licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
No Asbestos Detected (NAD)											
B1-A01	Shop 3, floor	Black and white vinyl	-	Yes	-	No Asbestos Detected	-	-	No further action required	28/2/2020 JBS&G SL	
B1-A02	Shop 3, western wall, infill panels	Fibre cement sheeting	-	Yes	-	No Asbestos Detected	-	-	No further action required	28/2/2020 JBS&G SL	
B1-AD02	Ceiling cavity	Accumulated dust	-	Yes	-	No Asbestos Detected	-	-	While no asbestos was detected, elevated levels of lead was detected within the ceiling dust and general access should be restricted to the area (refer to item B1-LD01 below). The LCD must be removed prior to demolition by an experience hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
Lead Containing Dust											
B1-LD01	Ceiling cavity	Accumulated dust	9	Yes	Friable	**540 mg/kg**	Poor	200 m^2	Restrict general access to area. if workers/visitors are required to enter the area, appropriate control measures must be implemented in accordance with AS4361.2-2017. Remove prior to demolition by an experience hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	
Lead Based Paints											
B1-LP01	Ground floor, Shops 1, 2 & 3, cement rendered walls	White paint	10	Yes	-	**1.3 % w/w**	Good	100 m^2	Paint well adhered to the building materials may be demolished if care is taken not to spread paint flakes to surrounding areas. Alternatively, remove all paint prior to demolition by an experienced hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	
B1-LP03	First floor, timber windows	White paint		Yes	-	**0.12% w/w**	Good	30 m^2	Paint well adhered to the building materials may be demolished if care is taken not to spread paint flakes to surrounding areas. Alternatively, remove all paint prior to demolition by an experienced hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	
B1-LP04	Roof, timber fascia	Brown paint	11	Yes	-	**0.22% w/w**	Poor	30 m^2	Remove loose and flaking paint prior to demolition by an experienced hazardous materials removal contractor in accordance with AS4361.2-2017. Remaining paint well adhered to the building materials may be demolished if care is taken not to spread paint flakes to surrounding areas. Alternatively, remove all paint prior to demolition by an experienced hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
-	Ground floor, Shop 3, front door frame	Black and white paints	-	Yes	-	**XRF > 2.5 mg/cm²**	Good	1 m²	Paint well adhered to the building materials may be demolished if care is taken not to spread paint flakes to surrounding areas. Alternatively, remove all paint prior to demolition by an experienced hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	
-	Ground floor, building exterior, walls	Various coloured paints	-	Yes	-	**XRF >3.0 mg/cm²**	Good	200 m²	Paint well adhered to the building materials may be demolished if care is taken not to spread paint flakes to surrounding areas. Alternatively, remove all paint prior to demolition by an experienced hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	
Non-Lead Based Paints											
B1-LP02	First floor, cement rendered walls	Cream paint	-	Yes	-	0.02% w/w	Good	-	No further action required	28/2/2020 JBS&G SL	
Polychlorinated Biphenyls (PCBs)											
-	First floor, Suite 4, fluorescent light fittings	RIFA Type PHN (6.5 µF capacitance) capacitors	12	Yes	-	**Confirmed PCB**	Good	10 units	Handle in accordance with ANZECC 1997	28/2/2020 JBS&G SL	
Detailed inspection of other light fittings could not be undertaken due to active electricity supply. All light fittings should be assumed to contain PCBs.									Undertake detailed inspection following isolation of electricity supply, OR Handle in accordance with ANZECC 1997	28/2/2020 JBS&G SL	
Synthetic Mineral Fibres (SMF)											
-	Ceiling cavity	Loose fill insulation	13	Yes	Bonded	**Assumed SMF**	Good	200 m²	Remove in accordance with NOHSC:2006 (1990)	28/2/2020 JBS&G SL	
-	Ceiling cavity, air conditioning ducting	Insulation	-	Yes	Bonded	**Assumed SMF**	Good	30 m²	Remove in accordance with NOHSC:2006 (1990)	28/2/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
-	First floor, kitchen, hot water system	Internal insulation	-	Yes	Bonded	**Assumed SMF**	Good	2 m^2	Remove in accordance with NOHSC:2006 (1990)	28/2/2020 JBS&G SL	
-	External west aspect, hot water systems (x2)	Internal insulation	14	Yes	Bonded	**Assumed SMF**	Good	4 m^2	Remove in accordance with NOHSC:2006 (1990)	28/2/2020 JBS&G SL	
Inaccessible Areas											
Suite 2 was tenanted and locked at the time of inspection. Hazardous materials identified in Suites 1, 3 and 4 are also assumed to be present in Suite 2.											

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Hazardous Materials Register (Rev 0)
Penrith City Village Park
Property #2 – 140-142 Henry Street, Penrith
Date of Production – 18 March 2020

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
Asbestos Containing Materials (ACM)											
B2-A01	Eastern Portion, east façade, eaves and fascia	Fibre cement sheeting	16	Yes	Non-friable	**Chrysotile and Amosite Asbestos**	Good	30 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	2/3/2020 JBS&G SL	
As per B2-A01	Eastern Portion, south façade, behind metal fascia	Fibre cement sheeting	17	No	Non-Friable	**Assumed Asbestos**	Unknown	Unknown	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	2/3/2020 JBS&G SL	
-	Eastern Portion, external electrical room	Electrical mounting boards	18	Yes	Non-friable	**Assumed Asbestos**	Good	3 boards	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	2/3/2020 JBS&G SL	
-	Eastern Portion, roof, south parapet	Fibre cement sheeting	19	No	Non-Friable	**Assumed Asbestos**	Good	10 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	2/3/2020 JBS&G SL	
As per B2-A01	Arcade, behind eastern sloped ceiling	Fibre cement sheeting	-	No	Non-Friable	**Assumed Asbestos**	Unknown	Unknown	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	2/3/2020 JBS&G SL	
-	Shop 1, electrical cabinet	Electrical mounting board	-	Yes	Non-friable	**Assumed Asbestos**	Good	1 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	2/3/2020 JBS&G SL	
-	Shop 9, ceiling cavity above toilets, skylight walls	Fibre cement sheeting	20	No	Non-friable	**Assumed Asbestos**	Good	10 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	2/3/2020 JBS&G SL	
-	Shop 10, staff room, south wall	Fibre cement sheeting	21	Yes	Non-Friable	**Assumed Asbestos**	Good	30 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	2/3/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
-	Shop 10, staff toilets, internal walls	Fibre cement sheeting	-	Yes	Non-Friable	**Assumed Asbestos**	Good	5 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	2/3/2020 JBS&G SL	
Asbestos Containing Dust (ACD)											
B3-AD02	Shop 4/5, ceiling cavity	Settled dust	22	Yes	Friable	**Chrysotile Asbestos in the form of loose fibre bundles**	Poor	620 m²	All dust within the ground floor ceiling cavity of the Western Portion should be assumed to be impacted with friable asbestos due to the potential for the friable ACD to have dispersed throughout. Access to the ground floor ceiling cavity shall be immediately restricted and appropriate asbestos warning signage installed to access/egress points to inform personnel of the known asbestos hazards for the interim period and until asbestos removal works can be completed. If workers are required to enter the area, appropriate control measures must be implemented in accordance with SWNSW 2019a/2019b. Remove prior to commencement of demolition works. Works to be completed under controlled conditions by Class A licensed removal contractor in accordance with SWNSW 2019a.	2/3/2020 JBS&G SL	
As per B3-AD02	Western Portion, ceiling cavity	Settled dust	-	Yes	Friable	**Assumed Asbestos**					
B3-AD01	Shop 7, ceiling cavity	Settled dust	-	Yes	Friable	No Asbestos Detected				2/3/2020 JBS&G SL	
B3-AD03	Shop 6, ceiling cavity	Settled dust	-	Yes	Friable	No Asbestos Detected				2/3/2020 JBS&G SL	
No Asbestos Detected (NAD)											
B2-A02	Eastern Portion, north awning, ceiling lining	Fibre cement sheeting	-	Yes	-	No Asbestos Detected	-	-	No further action required	2/3/2020 JBS&G SL	
B2-A03	Arcade, north gable	Fibre cement sheeting	-	Yes	-	No Asbestos Detected	-	-	No further action required	2/3/2020 JBS&G SL	
B3-A01	Shop 7/8, lunch room and hallway, floor	Cream vinyl	-	Yes	-	No Asbestos Detected	-	-	No further action required	2/3/2020 JBS&G SL	
B3-A02	Shop 9, kitchen/lunch room and hallway, floor	Blue/grey vinyl	-	Yes	-	No Asbestos Detected	-	-	No further action required	2/3/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
B3-A03	Western Portion, west façade, expansion joint	Bituminous material	-	Yes	-	No Asbestos Detected	-	-	No further action required	2/3/2020 JBS&G SL	
B3-A04	Western Portion, north awning, ceiling lining	Fibre cement sheeting	-	Yes	-	No Asbestos Detected	-	-	No further action required	2/3/2020 JBS&G SL	
B3-A05	Western Portion, south eaves	Fibre cement sheeting	-	Yes	-	No Asbestos Detected	-	-	No further action required	2/3/2020 JBS&G SL	
B3-A06	Western Portion, southern aspect, footpath, expansion joint	Bituminous material	-	Yes	-	No Asbestos Detected	-	-	No further action required	2/3/2020 JBS&G SL	
B2-AD01	Shop 2, ceiling cavity	Settled dust	-	Yes	-	No Asbestos Detected	-	-	While no asbestos was detected, elevated levels of lead was detected within the ceiling dust and general access should be restricted to the area (refer to item B2-LD01 below). The LCD must be removed prior to demolition by an experience hazardous materials removal contractor in accordance with AS4361.2-2017.	2/3/2020 JBS&G SL	
B3-AD04	Shop 9, ceiling cavity	Settled dust	-	Yes	-	No Asbestos Detected	-	-	While no asbestos was detected, elevated levels of lead was detected within the ceiling dust and general access should be restricted to the area (refer to item B3-AD04 below). The LCD must be removed prior to demolition by an experience hazardous materials removal contractor in accordance with AS4361.2-2017.	2/3/2020 JBS&G SL	
Lead Containing Dust											
B2-LD01	Shop 2, ceiling cavity	Settled dust	-	Yes	Friable	**380 mg/kg**	Poor	375 m^2 (whole Eastern Portion cavity)	Restrict general access to area. if workers/visitors are required to enter the area, appropriate control measures must be implemented in accordance with AS4361.2-2017. Remove prior to demolition by an experience hazardous materials removal contractor in accordance with AS4361.2-2017.	2/3/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
B3-LD01	Shop 7, ceiling cavity	Settled dust	-	Yes	Friable	120 mg/kg	Poor	-	Access to the ground floor ceiling cavity of the Western Portion shall be immediately restricted due to the presence of friable ACD (refer item B3-AD02 above). If workers are required to enter the area, appropriate control measures must be implemented in accordance with SWNSW 2019a/2019b and AS4361.2-2017. Remove prior to commencement of demolition works. Works to be completed under controlled conditions by Class A licensed removal contractor in accordance with SWNSW 2019a.	2/3/2020 JBS&G SL	
B3-LD02	Shop 4/5, ceiling cavity	Settled dust	22	Yes	Friable	210 mg/kg	Poor	-		2/3/2020 JBS&G SL	
B3-LD03	Shop 6, ceiling cavity	Settled dust	-	Yes	Friable	140 mg/kg	Poor	-		2/3/2020 JBS&G SL	
B3-LD04	Shop 9, ceiling cavity	Settled dust	-	Yes	Friable	**680 mg/kg**	Poor	320 m^2	Restrict general access to area. if workers/visitors are required to enter the area, appropriate control measures must be implemented in accordance with AS4361.2-2017. Remove prior to demolition by an experience hazardous materials removal contractor in accordance with AS4361.2-2017.	2/3/2020 JBS&G SL	
Lead Based Paints											
B3-LP02	Shop 10, toilet door frames	Cream paint	23	Yes	-	**0.17 % w/w**	Good	1 m^2	Paint well adhered to the building materials may be demolished if care is taken not to spread paint flakes to surrounding areas. Alternatively, remove all paint prior to demolition by an experienced hazardous materials removal contractor in accordance with AS4361.2-2017.	2/3/2020 JBS&G SL	
Non-Lead Based Paints											
B2-LP01	Eastern Portion, east aspect, toilet doors and door frames	Blue paint	-	Yes	-	0.1 % w/w	-	-	No further action required	2/3/2020 JBS&G SL	
-	Western and Eastern Portions, external	Various coloured paints	-	Yes	-	XRF < 0.1 mg/cm^2	-	-	No further action required	2/3/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
-	Western and Eastern Portions, internal	Various coloured paints	-	Yes	-	XRF < 0.1 mg/cm^2	-	-	No further action required	2/3/2020 JBS&G SL	
B2-LP02	Shop 1, toilets door frames	Cream paint	-	Yes	-	< 0.01 % w/w	-	-	No further action required	2/3/2020 JBS&G SL	
B3-LP01	Shop 7/8, toilets door frames	Dark blue paint	-	Yes	-	< 0.01 % w/w	-	-	No further action required	2/3/2020 JBS&G SL	
B3-LP03	Shop 9, toilet door frames	Blue/green paint	-	Yes	-	0.06 % w/w	-	-	No further action required	2/3/2020 JBS&G SL	
Polychlorinated Biphenyls (PCBs)											
Detailed inspection of light fittings could not be undertaken due to active electricity supply. All light fittings should be assumed to contain PCBs.									Undertake detailed inspection following isolation of electricity supply, <u>OR</u> Handle in accordance with ANZECC 1997	2/3/2020 JBS&G SL	
Synthetic Mineral Fibres (SMF)											
-	Ceiling cavity throughout property, roof	Insulation sarking	24	Yes	Bonded	**Assumed SMF**	Good	1500 m^2	Remove in accordance with NOHSC:2006 (1990)	2/3/2020 JBS&G SL	
-	Western Portion, ceiling cavity, air conditioning ducting	Insulation	25	Yes	Bonded	**Assumed SMF**	Good	100 m^2	Remove in accordance with NOHSC:2006 (1990)	2/3/2020 JBS&G SL	
-	Shop 2, hot water system	Internal Insulation	-	Yes	Bonded	**Assumed SMF**	Good	2 m^2	Remove in accordance with NOHSC:2006 (1990)	2/3/2020 JBS&G SL	
-	Shop 6, instant hot water system	Internal Insulation	26	Yes	Bonded	**Assumed SMF**	Good	1 m^2	Remove in accordance with NOHSC:2006 (1990)	2/3/2020 JBS&G SL	
-	Shop 7/8, suspended ceiling	Ceiling tiles	27	Yes	Bonded	**Assumed SMF**	Good	100 m^2	Remove in accordance with NOHSC:2006 (1990)	2/3/2020 JBS&G SL	
-	Shop 7/8, kitchen, hot/cold water system	Internal insulation	-	Yes	Bonded	**Assumed SMF**	Good	1 m^2	Remove in accordance with NOHSC:2006 (1990)	2/3/2020 JBS&G SL	
-	Eastern Portion, ceiling cavity above external male toilet, hot water system	Internal Insulation	-	Yes	Bonded	**Assumed SMF**	Good	10 m^2	Remove in accordance with NOHSC:2006 (1990)	2/3/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
Inaccessible Areas											
Shop 3 was tenanted and locked at the time of inspection. Hazardous materials identified in Shops 1 and 2 are also assumed to be present in Shop 3.											

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Hazardous Materials Register (Rev 0)
Penrith City Village Park
Property #3 – 144 Station Street, Penrith
Date of Production – 18 March 2020

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
Asbestos Containing Materials (ACM)											
-	Southern exterior, electrical cabinet	Electrical mounting board	29	No	Non-Friable	**Assumed Asbestos**	Unknown	Unknown	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	2/3/2020 JBS&G SL	
No Asbestos Detected (NAD)											
B4-A01	Unit 1, treatment rooms, floor	Blue vinyl	-	Yes	-	No Asbestos Detected	-	-	No further action required	2/3/2020 JBS&G SL	
B4-A02	Northern awning, soffit	Fibre cement sheeting	30	Yes	-	No Asbestos Detected	-	-	No further action required	2/3/2020 JBS&G SL	
B4-AD01	Unit 1, ceiling cavity	Settled dust	-	Yes	-	No Asbestos Detected	-	-	No further action required	2/3/2020 JBS&G SL	
B4-AD02	Unit 2, ceiling cavity	Settled dust	-	Yes	-	No Asbestos Detected	-	-	No further action required	2/3/2020 JBS&G SL	
Lead Containing Dust											
B4-LD01	Unit 1, ceiling cavity	Settled dust	-	Yes	-	220 mg/kg	-	-	No further action required	2/3/2020 JBS&G SL	
B4-LD02	Unit 2, ceiling cavity	Settled dust	-	Yes	-	140 mg/kg	-	-	No further action required	2/3/2020 JBS&G SL	
Lead Based Paints											
No Lead Based Paints were identified at the time of inspection									No further action required	2/3/2020 JBS&G SL	
Non-Lead Based Paints											
B4-LP01	Unit 1, toilet door and door frames	Blue paint	-	Yes	-	0.04% w/w	-	-	No further action required	2/3/2020 JBS&G SL	
B4-LP02	Unit 2, toilet door and door frames	White paint	-	Yes	-	0.03% w/w	-	-	No further action required	2/3/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
-	Throughout internal and external areas	Various coloured paints	-	Yes	-	XRF < 0.1 mg/cm^2	-	-	No further action required	2/3/2020 JBS&G SL	
Polychlorinated Biphenyls (PCBs)											
Detailed inspection of light fittings could not be undertaken due to active electricity supply. All light fittings should be assumed to contain PCBs.									Undertake detailed inspection following isolation of electricity supply, OR Handle in accordance with ANZECC 1997	2/3/2020 JBS&G SL	
Synthetic Mineral Fibres (SMF)											
-	Unit 1, suspended ceiling	Ceiling tiles	31	Yes	Bonded	**Assumed SMF**	Good	180 m^2	Remove in accordance with NOHSC:2006 (1990)	2/3/2020 JBS&G SL	
-	Unit 1, kitchen, instant hot water system	Internal insulation	-	Yes	Bonded	**Assumed SMF**	Good	1 m^2	Remove in accordance with NOHSC:2006 (1990)	2/3/2020 JBS&G SL	
-	Unit 2, kitchen, instant hot water system	Internal insulation	32	Yes	Bonded	**Assumed SMF**	Good	1 m^2	Remove in accordance with NOHSC:2006 (1990)	2/3/2020 JBS&G SL	
-	Ceiling cavity, roof sarking throughout	Insulation	33	Yes	Bonded	**Assumed SMF**	Good	360 m^2	Remove in accordance with NOHSC:2006 (1990)	2/3/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Hazardous Materials Register (Rev 0)
Penrith City Village Park
Property #4 – 42-44 Station Street, Penrith
Date of Production – 18 March 2020

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
Asbestos Containing Materials (ACM)											
B5-A01	Funeral Home, eaves, soffits and window soffits	Fibre cement sheeting	35	Yes	Non-Friable	**Chrysotile and Amosite Asbestos**	Good	40 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
B5-A04	Funeral Home, attic, walls	Fibre cement sheeting	36	Yes	Non-Friable	**Chrysotile and Amosite Asbestos**	Good	70 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
As per B5-A04	Funeral Home, walls and ceiling to external stairs	Fibre cement sheeting		Yes	Non-Friable	**Chrysotile and Amosite Asbestos**	Good	40 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
As per B5-A04	Funeral Home, east entry soffit	Fibre cement sheeting		Yes	Non-Friable	**Chrysotile and Amosite Asbestos**	Good	3 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
As per B5-A04	Funeral Home, attic and roof void, between rafters and joists	Fibre cement packers	37	Yes	Non-Friable	**Chrysotile and Amosite Asbestos**	Good	1 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
As per B5-A04	Funeral Home, roof void	Fibre cement fragments	38	Yes	Non-Friable	**Chrysotile and Amosite Asbestos**	Poor	5 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
B5-A05	Funeral Home, attic, bathroom, floor	Red vinyl tiles	39	Yes	Non-Friable	**Chrysotile Asbestos**	Good	6 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
-	Funeral Home, exterior, electrical cabinet	Electrical mounting board	40	Yes	Non-Friable	**Assumed Asbestos**	Good	1 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
-	Garage, interior, electrical cabinet	Electrical mounting board	-	Yes	Non-Friable	**Assumed Asbestos**	Good	1 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
Same as B5-A01	Garage, interior, toilet, ceiling	Fibre cement sheeting	41	Yes	Non-Friable	**Chrysotile and Amosite Asbestos**	Good	4 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
No Asbestos Detected (NAD)											
B5-A02	Garage, ceiling, sarking	Bituminous sarking	-	Yes	-	No Asbestos Detected	-	-	No further action required	28/2/2020 JBS&G SL	
B5-A03	Garage, partition wall	Fibre cement sheeting	-	Yes	-	No Asbestos Detected	-	-	No further action required	28/2/2020 JBS&G SL	
B5-A06	Funeral Home, attic, north room floor	Vinyl sheet with fibrous backing	-	Yes	-	No Asbestos Detected	-	-	No further action required	28/2/2020 JBS&G SL	
B5-A07	Funeral Home, roof void, redundant electrical wiring	Red cable sheath	-	Yes	-	No Asbestos Detected	-	-	No further action required	28/2/2020 JBS&G SL	
B5-A08	Funeral Home, roof void, redundant electrical wiring	Black cable sheath	-	Yes	-	No Asbestos Detected	-	-	No further action required	28/2/2020 JBS&G SL	
B5-A09	Garage, eastern exterior, windows	Putty	-	Yes	-	No Asbestos Detected	-	-	No further action required	28/2/2020 JBS&G SL	
B5-AD01	Garage, northern room, floor	Settled dust	-	Yes	-	No Asbestos Detected	-	-	While no asbestos was detected, elevated levels of lead was detected within the ceiling dust and general access should be restricted to the area (refer to item B5-LD01 below). The LCD must be removed prior to demolition by an experience hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
B5-AD02	Funeral Home, attic, bathroom, floor	Settled dust	-	Yes	-	No Asbestos Detected	-	-	While no asbestos was detected, elevated levels of lead was detected within the ceiling dust and general access should be restricted to the area (refer to item B5-LD02 below). The LCD must be removed prior to demolition by an experience hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	
B5-AD03	Funeral Home, roof void	Settled dust	-	Yes	-	No Asbestos Detected	-	-	While no asbestos was detected, elevated levels of lead was detected within the ceiling dust and general access should be restricted to the area (refer to item B5-LD03 below). The LCD must be removed prior to demolition by an experience hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	
Lead Containing Dust											
B5-LD02	Funeral Home, attic, bathroom, floor	Settled dust	-	Yes	Friable	**850 mg/kg**	Poor	6 m^2	Restrict general access to area. if workers/visitors are required to enter the area, appropriate control measures must be implemented in accordance with AS4361.2-2017. Remove prior to demolition by an experience hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	
B5-LD03	Funeral Home, roof void	Settled dust	42	Yes	Friable	**810 mg/kg**	Poor	250 m^2	Restrict general access to area. if workers/visitors are required to enter the area, appropriate control measures must be implemented in accordance with AS4361.2-2017. Remove prior to demolition by an experience hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
B5-LD01	Garage, northern room, floor	Settled dust	43	Yes	Friable	**350 mg/kg**	Poor	150 m^2 (assumed throughout)	Restrict general access to area. if workers/visitors are required to enter the area, appropriate control measures must be implemented in accordance with AS4361.2-2017. Remove prior to demolition by an experience hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	
Lead Based Paints											
B5-LP01	All buildings, exterior eaves, windows and door frames	White paint	44	Yes	-	**3.6% w/w**	Fair	40 m^2	Remove loose and flaking paint prior to demolition by an experienced hazardous materials removal contractor in accordance with AS4361.2-2017. Remaining paint well adhered to the building materials may be demolished if care is taken not to spread paint flakes to surrounding areas. Alternatively, remove all paint prior to demolition by an experienced hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	
B5-LP04	Funeral Home, western exterior, window frames	Cream paint	-	Yes	-	**0.12% w/w**	Good	10 m^2	Paint well adhered to the building materials may be demolished if care is taken not to spread paint flakes to surrounding areas. Alternatively, remove all paint prior to demolition by an experienced hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
B5-LP02	Garage, exterior, gutters and downpipes	Red paint	45	Yes	-	**0.71% w/w**	Fair	30 m^2	Remove loose and flaking paint prior to demolition by an experienced hazardous materials removal contractor in accordance with AS4361.2-2017. Remaining paint well adhered to the building materials may be demolished if care is taken not to spread paint flakes to surrounding areas. Alternatively, remove all paint prior to demolition by an experienced hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	
Non-Lead Based Paints											
B5-LP03	Funeral Home, south office, walls	Blue paint	-	Yes	-	0.08% w/w	-	-	No further action required	28/2/2020 JBS&G SL	
-	Funeral Home and Garage, internal and external	Remaining various coloured paints		Yes	-	XRF < 0.1 mg/cm^2	-	-	No further action required	28/2/2020 JBS&G SL	
Polychlorinated Biphenyls (PCBs)											
Detailed inspection of light fittings could not be undertaken due to active electricity supply. All light fittings should be assumed to contain PCBs.									Undertake detailed inspection following isolation of electricity supply, OR Handle in accordance with ANZECC 1997	28/2/2020 JBS&G SL	
Synthetic Mineral Fibres (SMF)											
	Funeral Home, east exterior, hot water system	Internal insulation	46	Yes	-	**Assumed SMF**	Good	4 m^2	Remove in accordance with NOHSC:2006 (1990)	28/2/2020 JBS&G SL	
	Garage, laundry, hot water system	Internal insulation	-	Yes	-	**Assumed SMF**	Good	2 m^2	Remove in accordance with NOHSC:2006 (1990)	28/2/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Hazardous Materials Register (Rev 0)
Penrith City Village Park
Property #5 – 46 Station Street, Penrith
Date of Production – 18 March 2020

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
Asbestos Containing Materials (ACM)											
B6-A04	Ground floor, kitchen, ceiling panels to cupboards	Fibre cement sheeting	48	Yes	Non-Friable	**Chrysotile, Amosite and Crocidolite Asbestos**	Good	3 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	3/3/2020 JBS&G SL	
As per B6-A04	Ground floor, bathroom, shower and cupboard above, ceilings	Fibre cement sheeting	-	Yes	Non-Friable	**Chrysotile, Amosite and Crocidolite Asbestos**	Good	3 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	3/3/2020 JBS&G SL	
B6-A06	Ground floor, corridor to first floor, electrical cabinet, internal lining	Fibre cement sheeting	49	Yes	Non-Friable	**Chrysotile and Amosite Asbestos**	Good	2 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	3/3/2020 JBS&G SL	
-	Ground floor, access corridor to first floor, electrical cabinet	Electrical mounting board	49	Yes	Non-Friable	**Assumed Asbestos**	Good	1 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	3/3/2020 JBS&G SL	
-	First floor, toilet hallway, ceiling	Fibre cement sheeting	50	Yes	Non-Friable	**Assumed Asbestos**	Good	2 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	3/3/2020 JBS&G SL	
-	External, aluminium windows	Putty	51	Yes	Non-Friable	**Assumed Asbestos**	Good	<1 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	3/3/2020 JBS&G SL	
-	Ground floor roof, parapet	Fibre cement sheeting	52	No	Non-Friable	**Assumed Asbestos**	Fair	10 m^2	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	3/3/2020 JBS&G SL	
-	Ground floor roof, air conditioning ducting	Mastic	53	No	Non-Friable	**Assumed Asbestos**	Unknown	Unknown	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	3/3/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
Asbestos Containing Dust (ACD)											
B6-AD01	First floor, ceiling cavity	Settled dust	54	Yes	Friable	**Chrysotile Asbestos in the form of loose fibre bundles**	Poor	180 m²	All dust within the ceiling cavity should be assumed to be impacted with friable asbestos due to the potential for the friable ACD to have dispersed throughout. Access to the ceiling cavity shall be immediately restricted and appropriate asbestos warning signage installed to access/egress points to inform personnel of the known asbestos hazards for the interim period and until asbestos removal works can be completed. If workers are required to enter the area, appropriate control measures must be implemented in accordance with SWNSW 2019a/2019b. Remove prior to commencement of demolition works. Works to be completed under controlled conditions by Class A licensed removal contractor in accordance with SWNSW 2019a.	3/3/2020 JBS&G SL	
No Asbestos Detected (NAD)											
B6-A01	Ground floor, vault room, floor	Grey vinyl tiles	-	Yes	-	No Asbestos Detected	-	-	No further action required	3/3/2020 JBS&G SL	
B6-A02	Ground floor, east office, floor	Cream vinyl	-	Yes	-	No Asbestos Detected	-	-	No further action required	3/3/2020 JBS&G SL	
B6-A03	Ground floor, kitchen, floor	Red vinyl	-	Yes	-	No Asbestos Detected	-	-	No further action required	3/3/2020 JBS&G SL	
B6-A05	External, west fascia panels	Fibre cement sheeting	-	Yes	-	No Asbestos Detected	-	-	No further action required	3/3/2020 JBS&G SL	
B6-A07	External, east parking area, expansion joint	Bituminous material	-	Yes	-	No Asbestos Detected	-	-	No further action required	3/3/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
Lead Containing Dust											
B6-LD01	First floor, ceiling space	Settled dust	54	Yes	Friable	**1300 mg/kg**	Poor	180 m²	Access to the ceiling cavity shall be immediately restricted due to the presence of friable ACD (refer item B6-AD01 above). If workers are required to enter the area, appropriate control measures must be implemented in accordance with SWNSW 2019a/2019b and AS4361.2-2017. Remove prior to commencement of demolition works. Works to be completed under controlled conditions by Class A licensed removal contractor in accordance with SWNSW 2019a.	3/3/2020 JBS&G SL	
Lead Based Paints											
B6-LP02	External, stairs to first floor, metal pole	White paint	55	Yes	-	**0.39% w/w**	Fair	1 m²	Remove loose and flaking paint prior to demolition by an experienced hazardous materials removal contractor in accordance with AS4361.2-2017. Remaining paint well adhered to the building materials may be demolished if care is taken not to spread paint flakes to surrounding areas. Alternatively, remove all paint prior to demolition by an experienced hazardous materials removal contractor in accordance with AS4361.2-2017.	3/3/2020 JBS&G SL	
Non-Lead Based Paints											
B6-LP01	Ground floor, toilets, doors and door frames	Purple paint	-	Yes	-	0.06% w/w	Good	-	No further action required	3/3/2020 JBS&G SL	
B6-LP03	First floor, female toilet, cabinet	White paint	-	Yes	-	0.05% w/w	Good	-	No further action required	3/3/2020 JBS&G SL	
B6-LP04	First floor, male and female toilet, walls	Brown paint	-	Yes	-	0.04% w/w	Good	-	No further action required	3/3/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
B6-LP05	First floor, east office, walls	Cream paint	-	Yes	-	0.04% w/w	Good	-	No further action required	3/3/2020 JBS&G SL	
Polychlorinated Biphenyls (PCBs)											
Detailed inspection of light fittings could not be undertaken due to active electricity supply. All light fittings should be assumed to contain PCBs.									Undertake detailed inspection following isolation of electricity supply, OR Handle in accordance with ANZECC 1997	3/3/2020 JBS&G SL	
Synthetic Mineral Fibres (SMF)											
-	Ground floor, bathroom, cupboard above shower, hot water system	Internal insulation	56	Yes	Bonded	**Assumed SMF**	Good	2 m^2	Remove in accordance with NOHSC:2006 (1990)	3/3/2020 JBS&G SL	
-	First floor, kitchen, hot water system	Internal insulation	-	Yes	Bonded	**Assumed SMF**	Good	2 m^2	Remove in accordance with NOHSC:2006 (1990)	3/3/2020 JBS&G SL	
-	First floor, ceiling cavity	Insulation batts	57	Yes	Bonded	**Assumed SMF**	Good	180 m^2	Remove in accordance with NOHSC:2006 (1990)	3/3/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Hazardous Materials Register (Rev 0)
Penrith City Village Park
Property #6 – 48-50 Station Street, Penrith
Date of Production – 18 March 2020

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
Asbestos Containing Materials (ACM)											
B7-A01	Central portion, floor	Fibre cement fragments	59	Yes	Non-Friable	**Chrysotile and Crocidolite Asbestos**	Poor	<1 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
B7-A02	Ceiling cavity	Fibre cement fragments	60	Yes	Non-Friable	**Chrysotile, Amosite and Crocidolite Asbestos**	Poor	<1 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
B7-A04	Toilets, ceiling	Fibre cement sheeting	61	Yes	Non-Friable	**Chrysotile, Amosite and Crocidolite Asbestos**	Good	10 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
-	Electrical room	Electrical mounting board	-	Yes	Non-Friable	**Assumed Asbestos**	Good	1 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
-	Electrical room and ceiling cavity, sprinkler system pipework	Gaskets	62	Yes	Non-Friable	**Assumed Asbestos**	Good	<1 m²	Remove prior to demolition. Works to be completed under controlled conditions by Class A or B licensed removal contractor in accordance with SWNSW 2019a	28/2/2020 JBS&G SL	
Asbestos Containing Dust (ACD)											
B7-AD01	Ceiling cavity	Settled dust	63	Yes	Friable	**Chrysotile Asbestos in the form of loose fibre bundles**	Poor	1000 m² (ceiling cavity and floor area combined)	All dust within the building should be assumed to be impacted with friable asbestos due to the potential for the friable ACD to have dispersed throughout. Access to the building shall be immediately restricted and appropriate asbestos warning signage installed to access/egress points to inform personnel of the known asbestos hazards for the	28/2/2020 JBS&G SL	
B7-AD02	Electrical room, floor	Settled dust	-	Yes	Friable	**Crocidolite Asbestos detected in the form of loose fibre bundles**				28/2/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G SAMPLE NO.	LOCATION	MATERIAL DESCRIPTION	PHOTO NUMBER	ACCESSIBLE AREA?	FRIABILITY	ANALYTICAL RESULT	MATERIAL CONDITION	APPROX. QUANTITY	ACTION REQUIRED	DATE OF LAST INSPECTION (INCL. COMPANY NAME AND INITIALS)	DATE OF CONTROL ACTION &/OR REMOVAL
As per B7-AD02	Throughout, floor	Settled dust	-	Yes	Friable	**Assumed Asbestos**			interim period and until asbestos removal works can be completed. If workers are required to enter the area, appropriate control measures must be implemented in accordance with SWNSW 2019a/2019b. Remove prior to commencement of demolition works. Works to be completed under controlled conditions by Class A licensed removal contractor in accordance with SWNSW 2019a.	28/2/2020 JBS&G SL	
No Asbestos Detected (NAD)											
B7-A03	External, west façade, fascia panels	Fibre cement sheeting	-	Yes	-	No Asbestos Detected	-	-	No further action required	28/2/2020 JBS&G SL	
B7-A05	External, south wall, expansion joint	Bituminous material	-	Yes	-	No Asbestos Detected	-	-	No further action required	28/2/2020 JBS&G SL	
B7-A06	External, south footpath, expansion joint	Bituminous material	-	Yes	-	No Asbestos Detected	-	-	No further action required	28/2/2020 JBS&G SL	
Lead Containing Dust											
B7-LD01	Ceiling cavity	Settled dust	-	Yes	Friable	**770 mg/kg**	Poor	1000 m^2 (ceiling cavity and floor area combined)	Access to building shall be immediately restricted due to the presence of friable ACD (refer items B7-AD01 and B7-AD02 above). If workers are required to enter the area, appropriate control measures must be implemented in accordance with SWNSW 2019a/2019b and AS4361.2-2017. Remove prior to commencement of demolition works. Works to be completed under controlled conditions by Class A licensed removal contractor in accordance with SWNSW 2019a.	28/2/2020 JBS&G SL	
B7-LD02	Electrical room, floor	Settled dust	-	Yes	Friable	**1300 mg/kg**				28/2/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Lead Based Paints											
B7-LP01	Toilets, door and door frame	Maroon paint	64	Yes	-	**0.16% w/w**	Good	2 m^2	Paint well adhered to the building materials may be demolished if care is taken not to spread paint flakes to surrounding areas. Alternatively, remove all paint prior to demolition by an experienced hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	
B7-LP01	Ceiling cavity, steel framework	Red paint	65	Yes	-	**0.89% w/w**	Good	80 m^2	Paint well adhered to the building materials may be demolished if care is taken not to spread paint flakes to surrounding areas. Alternatively, remove all paint prior to demolition by an experienced hazardous materials removal contractor in accordance with AS4361.2-2017.	28/2/2020 JBS&G SL	
Polychlorinated Biphenyls (PCBs)											
Detailed inspection of light fittings could not be undertaken due to active electricity supply. All light fittings should be assumed to contain PCBs.									Undertake detailed inspection following isolation of electricity supply, OR Handle in accordance with ANZECC 1997	28/2/2020 JBS&G SL	
Synthetic Mineral Fibres (SMF)											
-	Toilets, instant hot water system	Internal insulation	66	Yes	Bonded	**Assumed SMF**	Good	2 m^2	Remove in accordance with NOHSC:2006 (1990)	28/2/2020 JBS&G SL	
-	Ceiling cavity, roof	Insulation sarking	67	Yes	Bonded	**Assumed SMF**	Good	500 m^2	Remove in accordance with NOHSC:2006 (1990)	28/2/2020 JBS&G SL	
-	Ceiling cavity, air conditioning ducting	Insulation	68	Yes	Bonded	**Assumed SMF**	Good	100 m^2	Remove in accordance with NOHSC:2006 (1990)	28/2/2020 JBS&G SL	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix B Photographs

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Photo 1: Overview of the Property #1

Photo 2: Property #1, Exterior, rooftop plant area, beneath new grey membrane – Asbestos containing black bituminous membrane

Photo 3: Property #1, Exterior, rooftop plant area, walls – Asbestos fibre cement sheeting

Photo 4: Property #1, Ceiling cavity – Asbestos fibre cement debris

Photo 5: Property #1, Awning, Ground floor, awning and ceiling lining – Asbestos fibre cement sheeting

Photo 6: Property #1, Eaves, soffits and ceiling lining to external stairs – Asbestos fibre cement sheeting

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Appendix B: Photographs

Client: Penrith City Council

Project: Penrith City Park Pre-remediation works

Job No: 58140 File Name: R006 App B - Photo Log

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Photo 7: Property #1, Top of external stairs, electrical cabinet – Assumed asbestos electrical mounting board

Photo 8: Property #1, Ground floor, Shop 3, electrical cabinet - Asbestos Electrical mounting boards and Asbestos containing dust

Photo 9: Property #1, Ceiling cavity – Lead containing accumulated dust

Photo 10: Property #1, Ground floor, Shops 1, 2 & 3, cement rendered walls – Lead based white paint

Photo 11: Property #1, Exterior, roof, timber fascia – Lead based brown paint

Photo 12: Property #1 First floor, Suite 4, fluorescent light fittings – PCB containing RIFA Type PHN (6.5 µF capacitance) capacitors

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Version: 1, Version Date: 14/04/2021

Photo 13: Property #1, Ceiling cavity – Loose fill SMF insulation

Photo 14: Property #1, External west aspect, hot water systems (x2) – Internal SMF insulation

Photo 15: Property #2, Overview

Photo 16: Property #2, Eastern Portion, east façade, eaves and fascia - Asbestos fibre cement sheeting

Photo 17: Property #2, Eastern Portion, south façade, behind metal fascia - Asbestos fibre cement sheeting

Photo 18: Property #2, Eastern Portion, external electrical room – Asbestos electrical mounting boards

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Version: 1, Version Date: 14/04/2021

Photo 19: Property #2, Eastern Portion, roof, south parapet - Assumed asbestos fibre cement sheeting

Photo 20: Property #2, Shop 9, ceiling cavity above toilets, skylight walls – Assumed asbestos fibre cement sheeting

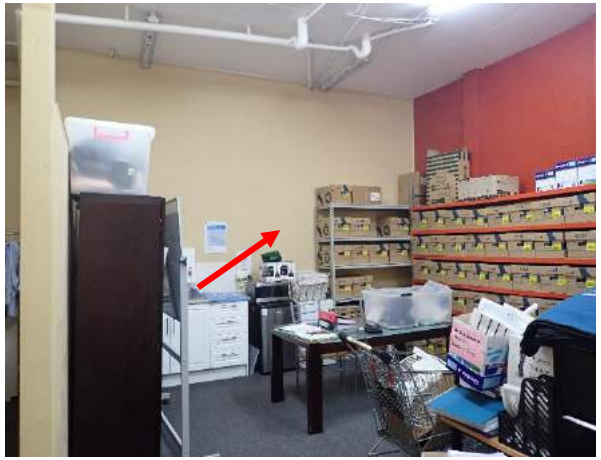

Photo 21: Property #2, Shop 10, staff room, south wall – Assumed asbestos fibre cement sheeting

Photo 22: Property #2, Shop 4/5, Ceiling cavity – Settled asbestos containing dust

Photo 23: Property #2, Shop 10, toilet door frames – Lead based cream paint

Photo 24: Property #2, Ceiling cavity throughout property, roof – SMF insulation sarking

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Photo 25: Property #2, Western Portion, ceiling cavity, air conditioning ducting – SMF insulation

Photo 26: Property #2, Shop 6, instant hot water system – SMF internal insulation

Photo 27: Property #2, Shop 7/8, suspended ceiling – SMF Ceiling tiles

Photo 28: Property #3, Overview

Photo 29: Property #3, Southern exterior, electrical cabinet – Assumed asbestos Electrical mounting board

Photo 30: Property #3, Northern awning, soffit – Non-asbestos fibre cement sheeting

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Project: Penrith City Park Pre-remediation works

Job No: 58140 File Name: R006 App B - Photo Log

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Photo 31: Property #3, Unit 1, suspended ceiling – SMF Ceiling tiles

Photo 32: Property #3, Unit 2, kitchen, instant hot water system – SMF internal insulation

Photo 33: Property #3, ceiling cavity, roof – SMF insulation sarking

Photo 34: Property #4, Overview

Photo 35: Property #4, Funeral Home, eaves, soffits and window soffits – Asbestos fibre cement sheeting

Photo 36: Property #4, Funeral Home, attic walls – Asbestos fibre cement sheeting

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Photo 37: Property #4, Funeral Home, attic and roof void, between rafters and joists – Asbestos fibre cement packers

Photo 38: Property #4, Funeral Home, roof void – Asbestos fibre cement fragments

Photo 39: Property #4, Funeral Home, attic, bathroom, floor – Asbestos containing red vinyl tiles

Photo 40: Property #4, Funeral Home, exterior, electrical cabinet – Assumed asbestos electrical mounting board

Photo 41: Property #4, Garage, interior, toilet, ceiling – Asbestos fibre cement sheeting

Photo 42: Property #4, Funeral Home, roof void – Lead containing settled dust

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Photo 43: Property #4, Garage, northern room, floor – Lead containing settled dust

Photo 44: Property #4, All buildings, exterior eaves, windows and door frames – Lead based white paint

Photo 45: Property #4, Garage, exterior, gutters and downpipes – Lead based red paint

Photo 46: Property #4, Funeral Home, east exterior, hot water system – SMF internal insulation

Photo 47: Property #5, Overview

Photo 48: Property #5, Ground floor, kitchen, ceiling panels to cupboards – Asbestos fibre cement sheeting

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Job No: 58140 File Name: R006 App B - Photo Log

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

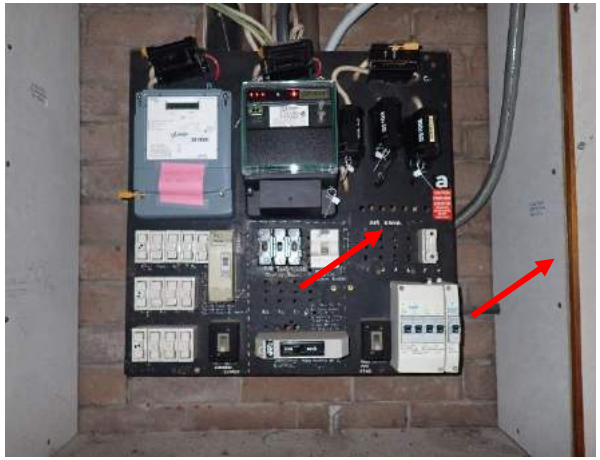

Photo 49: Property #5, Ground floor, corridor to first floor, electrical cabinet,– Asbestos electrical backing board and asbestos fibre cement sheeting

Photo 50: Property #5, First floor, toilet hallway, ceiling - Asbestos fibre cement sheeting

Photo 51: Property #5, External, aluminium windows – Assumed asbestos window putty

Photo 52: Property #5, Ground floor roof, parapet – Assumed asbestos fibre cement sheeting

Photo 53: Property #5, Ground floor roof, air conditioning ducting – Assumed asbestos mastic

Photo 54: Property #5, First floor, ceiling cavity – Asbestos and lead containing settled dust

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Job No: 58140 File Name: R006 App B - Photo Log

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Photo 55: Property #5, External, stairs to first floor, metal pole – Lead based white paint

Photo 56: Property #5, Ground floor, bathroom, cupboard above shower, hot water system – SMF internal insulation

Photo 57: Property #5, First floor, ceiling cavity – SMF insulation batts

Photo 58: Property #6, Overview

Photo 59: Property #6, Central portion, floor - Asbestos fibre cement fragments

Photo 60: Property #6, Ceiling cavity - Asbestos fibre cement fragments

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0	Original Issue -	SL	18/10/2019

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Version: 1, Version Date: 14/04/2021

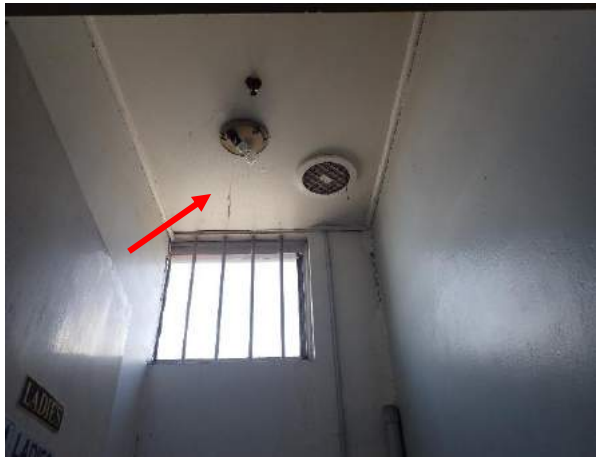

Photo 61: Property #6, Toilets, ceiling – Asbestos fibre cement sheeting

Photo 62: Property #6, Electrical room and ceiling cavity, sprinkler system pipework – Assumed asbestos gaskets

Photo 63: Property #6, Ceiling cavity – Asbestos and lead containing settled dust

Photo 64: Property #6, Toilet, door and door frame – Lead based maroon paint

Photo 65: Property #6, Ceiling cavity, steel framework – Lead based red paint

Photo 66: Property #6, Toilets, instant hot water system – SMF internal insulation

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0	Original Issue -	SL	18/10/2019

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Appendix B: Photographs

Client: Penrith City Council

Project: Penrith City Park Pre-remediation works

Job No: 58140 File Name: R006 App B - Photo Log

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Photo 67: Property #6, Ceiling cavity, roof – SMF insulation sarking

Photo 68: Property #6, Ceiling cavity, air conditioning ducting – SMF insulation

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0	Original Issue -	SL	18/10/2019

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Appendix B: Photographs

Client: Penrith City Council

Project: Penrith City Park Pre-remediation works

Job No: 58140 File Name: R006 App B - Photo Log

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix C Laboratory Analysis Reports and Chain of Custody Documentation

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

Attention:	Stuart Lumsden
Report	705518-AID
Project Name	PENRITH
Project ID	58140
Received Date	Mar 03, 2020
Date Reported	Mar 10, 2020

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

Project Name PENRITH
Project ID 58140
Date Sampled Mar 03, 2020
Report 705518-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
B1-A01	20-Ma03541	Mar 03, 2020	Approximate Sample 3g / 65x45x3mm Sample consisted of: Creamy-white flexible vinyl-like sheet	No asbestos detected. Synthetic mineral fibre detected. No trace asbestos detected.
B1-A02	20-Ma03542	Mar 03, 2020	Approximate Sample 1g / 25x10x3mm Sample consisted of: Brown fibre cement fragments and white paint	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B1-A03	20-Ma03543	Mar 03, 2020	Approximate Sample <1g / 20x10x3mm Sample consisted of: a) White flexible vinyl-like material b) Black bituminous back layer	Chrysotile and amosite asbestos detected (b).
B1-A04	20-Ma03544	Mar 03, 2020	Approximate Sample <1g / 20x20x4mm Sample consisted of: Grey compressed fibre cement fragments	Chrysotile asbestos detected.
B1-A05	20-Ma03545	Mar 03, 2020	Approximate Sample 29g / 120x40x5mm Sample consisted of: Grey compressed fibre cement fragment	Chrysotile asbestos detected.
B1-A06	20-Ma03546	Mar 03, 2020	Approximate Sample 1g / 20x10x9mm Sample consisted of: a) Grey compressed fibre cement fragment b) Grey paint	Chrysotile asbestos detected.
B1-A07	20-Ma03547	Mar 03, 2020	Approximate Sample 2g / 40x15x4mm Sample consisted of: a) Grey compressed fibre cement fragment b) Cream-white paint	Chrysotile, amosite and crocidolite asbestos detected (a).
B2-A01	20-Ma03548	Mar 03, 2020	Approximate Sample 1g / 25x10x5mm Sample consisted of: a) Grey compressed fibre cement fragments b) Brown paint	Chrysotile and amosite asbestos detected (a).

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
B2-A02	20-Ma03549	Mar 03, 2020	Approximate Sample <1g / 25x10x4mm Sample consisted of: Brown fibre cement fragments with blue paint	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B2-A03	20-Ma03550	Mar 03, 2020	Approximate Sample <1g / 20x10x3mm Sample consisted of: Brown fibre cement fragments with grey paint	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B3-A01	20-Ma03551	Mar 03, 2020	Approximate Sample 1g / 30x15x3mm Sample consisted of: Brown-grey flexible vinyl-like fragment with brown adhesive	No asbestos detected. Synthetic mineral fibre detected. No trace asbestos detected.
B3-A02	20-Ma03552	Mar 03, 2020	Approximate Sample 2g / 35x10x3mm Sample consisted of: Grey flxible vinyl-like fragment with brown adhesive	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B3-A03	20-Ma03553	Mar 03, 2020	Approximate Sample 1g / 30x15x3mm Sample consisted of: Black bituminous-like material	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B3-A04	20-Ma03554	Mar 03, 2020	Approximate Sample 2g / 20x10x10mm Sample consisted of: Grey fibre cement fragment	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B3-A05	20-Ma03555	Mar 03, 2020	Approximate Sample <1g / 20x10x3mm Sample consisted of: Brown fibre cement fragments with grey paint	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B3-A06	20-Ma03556	Mar 03, 2020	Approximate Sample 3g / 40x20x10mm Sample consisted of: Black fibrous bituminous material	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B4-A01	20-Ma03557	Mar 03, 2020	Approximate Sample 1g / 20x15x3mm Sample consisted of: Blue-white flexible vinyl-like fragment with fibrous material attached	No asbestos detected. Synthetic mineral fibre detected. Organic fibre detected. No trace asbestos detected.
B4-A02	20-Ma03558	Mar 03, 2020	Approximate Sample 2g / 40x10x5mm Sample consisted of: Brown fibre cement fragments and green paint	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B5-A01	20-Ma03559	Mar 03, 2020	Approximate Sample 5g / 40x20x5mm Sample consisted of: a) Grey compressed fibre cement fragment b) Green - pink paint	Chrysotile and amosite asbestos detected (a).
B5-A02	20-Ma03560	Mar 03, 2020	Approximate Sample 1g / 25x10x3mm Sample consisted of: Black bituminous fibrous material	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B5-A03	20-Ma03561	Mar 03, 2020	Approximate Sample 1g / 20x15x4mm Sample consisted of: Grey fibre cement fragments	No asbestos detected. Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
B5-A04	20-Ma03562	Mar 03, 2020	Approximate Sample 21g / 55x50x5mm Sample consisted of: a) Grey compressed fibre cement fragment b) Brown paint	Chrysotile and amosite asbestos detected.
B5-A05	20-Ma03563	Mar 03, 2020	Approximate Sample 2g / 30x10x3mm Sample consisted of: Red brittle vinyl-like fragment and white fibrous bundles attached with adhesive	Chrysotile asbestos detected.
B5-A06	20-Ma03564	Mar 03, 2020	Approximate Sample 8g / 100x50x4mm Sample consisted of: Black bituminous fibrous material with brown soft fibrous material	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B5-A07	20-Ma03565	Mar 03, 2020	Approximate Sample 1g / 50x5x5mm Sample consisted of: Metalic wire coated with tan fibrus material	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B5-A08	20-Ma03566	Mar 03, 2020	Approximate Sample 1g / 30x5x4mm Sample consisted of: Metalic wire coated with black bituminous-like fibrous material	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B5-A09	20-Ma03567	Mar 03, 2020	Approximate Sample 6g / 30x15x10mm Sample consisted of: Tan hard mastic-like fragments	No asbestos detected. No trace asbestos detected.
B6-A01	20-Ma03568	Mar 03, 2020	Approximate Sample 2g / 40x20x3mm Sample consisted of: Grey semi-hard vinyl-like material and brown plaster-like cement material	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B6-A02	20-Ma03569	Mar 03, 2020	Approximate Sample 2g / 50x20x3mm Sample consisted of: Brown-white flexible vinyl-like fragment	No asbestos detected. Synthetic mineral fibre detected. No trace asbestos detected.
B6-A03	20-Ma03570	Mar 03, 2020	Approximate Sample 2g / 70x25x3mm Sample consisted of: Tan-white flexible vinyl-like fragment	No asbestos detected. Synthetic mineral fibre detected. No trace asbestos detected.
B6-A04	20-Ma03571	Mar 03, 2020	Approximate Sample 12g / 50x35x5mm Sample consisted of: a) Grey compressed fibre cement fragment b) Brown paint	Chrysotile, amosite and crocidolite asbestos detected (a).
B6-A05	20-Ma03572	Mar 03, 2020	Approximate Sample <1g / 20x10x3mm Sample consisted of: Grey fibre cement fragments and grey paint	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B6-A06	20-Ma03583	Mar 03, 2020	Approximate Sample 1g / 20x15x5mm Sample consisted of: Grey compressed fibre cement fragment	Chrysotile and amosite asbestos detected.
B6-A07	20-Ma03584	Mar 03, 2020	Approximate Sample 2g / 50x10x4mm Sample consisted of: Black bitumen-like material	No asbestos detected. Organic fibre detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
B7-A01	20-Ma03585	Mar 03, 2020	Approximate Sample 2g / 30x15x4mm Sample consisted of: Grey compressed fibre cement fragment	Chrysotile and crocidolite asbestos detected.
B7-A02	20-Ma03586	Mar 03, 2020	Approximate Sample 7g / 40x20x5mm Sample consisted of: Grey compressed fibre cement fragment	Chrysotile, amosite and crocidolite asbestos detected.
B7-A03	20-Ma03587	Mar 03, 2020	Approximate Sample <1g / 20x10x3mm Sample consisted of: Grey fibre cement fragments	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B7-A04	20-Ma03588	Mar 03, 2020	Approximate Sample <1g / 10x10x3mm Sample consisted of: a) Grey compressed fibre cement fragments b) White paint	Chrysotile, amosite and crocidolite asbestos detected (a).
B7-A05	20-Ma03589	Mar 03, 2020	Approximate Sample 1g / 15x10x5mm Sample consisted of: Black soft fibrous bituminous material and yellow paint	No asbestos detected. Organic fibre detected.
B7-A06	20-Ma03618	Mar 03, 2020	Approximate Sample 1g / 20x10x3mm Sample consisted of: Black fibrous bituminus material	No asbestos detected. Organic fibre detected.
B1-AD01	20-Ma03619	Mar 03, 2020	Approximate Sample 1g / 70x10x3mm Sample consisted of: Black fibrous bituminous material	Chrysotile asbestos detected.
B1-AD02	20-Ma03620	Mar 03, 2020	Approximate Sample 1g / 60x30x3mm Sample consisted of: Brown dust and debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
B2-AD01	20-Ma03621	Mar 03, 2020	Approximate Sample <1g / 20x10x3mm Sample consisted of: Brown fibrous plaster-like material, corroded metal and fibres	No asbestos detected. Organic fibre detected. No trace asbestos detected.
B3-AD02	20-Ma03622	Mar 03, 2020	Approximate Sample 6g/60x30x5mm Sample consisted of: Brown dust and debris	Chrysotile asbestos detected in the form of loose fibre bundle. Approximate raw weight of asbestos containing material = 0.00010g* Total estimated asbestos content in the sample = 0.00010g* Total estimated asbestos concentration = 0.0017% w/w* No asbestos detected at the reporting limit of 0.01% w/w. Synthetic mineral fibre detected. Organic fibre detected. No trace asbestos detected.
B3-AD03	20-Ma03623	Mar 03, 2020	Approximate Sample 1g/30x20x3mm Sample consisted of: Brown dust and debris	No asbestos detected at the reporting limit of 0.01% w/w. Synthetic mineral fibre detected. Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
B3-AD04	20-Ma03624	Mar 03, 2020	Approximate Sample 1g/10x10x2mm Sample consisted of: Brown dust and debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
B4-AD01	20-Ma03625	Mar 03, 2020	Approximate Sample 1g / 50x20x3mm Sample consisted of: Brown dust, debris, plaster material and wood chips	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
B4-AD02	20-Ma03626	Mar 03, 2020	Approximate Sample 1g/5x5x2mm Sample consisted of: Brown dust, debris, plaster cement	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
B5-AD01	20-Ma03627	Mar 03, 2020	Approximate Sample 3g / 35x20x5mm Sample consisted of: Brown dust, debris, white paper-like material and grey concrete cement	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
B5-AD02	20-Ma03628	Mar 03, 2020	Approximate Sample 1g/30x20x3mm Sample consisted of: Brown dust and debris	No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.
B5-AD03	20-Ma03629	Mar 03, 2020	Approximate Sample 18g/100x30x10mm Sample consisted of: Brown dust and debris	No asbestos detected at the reporting limit of 0.01% w/w. Synthetic mineral fibre detected. Organic fibre detected. No trace asbestos detected.
B6-AD01	20-Ma03630	Mar 03, 2020	Approximate Sample 1g/20x20x3mm Sample consisted of: Brown dust and debris	Crocidolite asbestos detected in weathered fibre cement fragment. Approximate raw weight of asbestos containing material = 0.0012g Total estimated asbestos content in the sample = 0.00084g* Total estimated asbestos concentration = 0.12% w/w* Organic fibre detected. No trace asbestos detected.
B7-AD01	20-Ma03631	Mar 03, 2020	Approximate Sample 1g/20x10x3mm Sample consisted of: Brown dust and debris	Chrysotile asbestos detected in the form of loose fibre bundle. Approximate raw weight of asbestos = 0.00030g* Total estimated asbestos content in the sample = 0.00029g* Total estimated asbestos concentration = 0.057% w/w* Organic fibre detected. No trace asbestos detected.
B7-AD02	20-Ma03632	Mar 03, 2020	Approximate Sample 8g/50x30x5mm Sample consisted of: Brown dust, debris, corroded metal, glass fragments, fibrous material	Crocidolite asbestos detected in the form of loose fibre bundle. Approximate raw weight of asbestos = 0.00020g* Total estimated asbestos content in the sample = 0.00019g* Total estimated asbestos concentration = 0.0025% w/w* No asbestos detected at the reporting limit of 0.01% w/w. Organic fibre detected. No trace asbestos detected.

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
B3-AD01	20-Ma05678	Mar 03, 2020	Approximate Sample 1g / 20x10x3mm Sample consisted of: Brown dust and debris	No asbestos detected at the reporting limit of 0.01% w/w. Synthetic mineral fibre detected. Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Mar 10, 2020	Indefinite
Asbestos - LTM-ASB-8020	Sydney	Mar 10, 2020	Indefinite

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Project Name: PENRITH
Project ID: 58140

Order No.:
Report #: 705518
Phone: 02 8245 0300
Fax:

Received: Mar 3, 2020 6:30 PM
Due: Mar 10, 2020
Priority: 5 Day
Contact Name: Stuart Lumsden

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	CANCELLED	Lead	Lead (% w/w)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
External Laboratory										
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
1	B1-A01	Mar 03, 2020		Building Materials	S20-Ma03541		X			
2	B1-A02	Mar 03, 2020		Building Materials	S20-Ma03542		X			
3	B1-A03	Mar 03, 2020		Building Materials	S20-Ma03543		X			
4	B1-A04	Mar 03, 2020		Building Materials	S20-Ma03544		X			
5	B1-A05	Mar 03, 2020		Building Materials	S20-Ma03545		X			
6	B1-A06	Mar 03, 2020		Building Materials	S20-Ma03546		X			

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
7	B1-A07	Mar 03, 2020		Building Materials	S20-Ma03547		X			
8	B2-A01	Mar 03, 2020		Building Materials	S20-Ma03548		X			
9	B2-A02	Mar 03, 2020		Building Materials	S20-Ma03549		X			
10	B2-A03	Mar 03, 2020		Building Materials	S20-Ma03550		X			
11	B3-A01	Mar 03, 2020		Building Materials	S20-Ma03551		X			
12	B3-A02	Mar 03, 2020		Building Materials	S20-Ma03552		X			
13	B3-A03	Mar 03, 2020		Building Materials	S20-Ma03553		X			
14	B3-A04	Mar 03, 2020		Building	S20-Ma03554		X			

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
				Materials						
15	B3-A05	Mar 03, 2020		Building Materials	S20-Ma03555		X			
16	B3-A06	Mar 03, 2020		Building Materials	S20-Ma03556		X			
17	B4-A01	Mar 03, 2020		Building Materials	S20-Ma03557		X			
18	B4-A02	Mar 03, 2020		Building Materials	S20-Ma03558		X			
19	B5-A01	Mar 03, 2020		Building Materials	S20-Ma03559		X			
20	B5-A02	Mar 03, 2020		Building Materials	S20-Ma03560		X			
21	B5-A03	Mar 03, 2020		Building Materials	S20-Ma03561		X			

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
22	B5-A04	Mar 03, 2020		Building Materials	S20-Ma03562		X			
23	B5-A05	Mar 03, 2020		Building Materials	S20-Ma03563		X			
24	B5-A06	Mar 03, 2020		Building Materials	S20-Ma03564		X			
25	B5-A07	Mar 03, 2020		Building Materials	S20-Ma03565		X			
26	B5-A08	Mar 03, 2020		Building Materials	S20-Ma03566		X			
27	B5-A09	Mar 03, 2020		Building Materials	S20-Ma03567		X			
28	B6-A01	Mar 03, 2020		Building Materials	S20-Ma03568		X			
29	B6-A02	Mar 03, 2020		Building	S20-Ma03569		X			

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Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	CANCELLED	Lead	Lead (% w/w)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
				Materials						
30	B6-A03	Mar 03, 2020		Building Materials	S20-Ma03570		X			
31	B6-A04	Mar 03, 2020		Building Materials	S20-Ma03571		X			
32	B6-A05	Mar 03, 2020		Building Materials	S20-Ma03572		X			
33	B6-A06	Mar 03, 2020		Building Materials	S20-Ma03583		X			
34	B6-A07	Mar 03, 2020		Building Materials	S20-Ma03584		X			
35	B7-A01	Mar 03, 2020		Building Materials	S20-Ma03585		X			
36	B7-A02	Mar 03, 2020		Building Materials	S20-Ma03586		X			

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Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	CANCELLED	Lead	Lead (% w/w)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
37	B7-A03	Mar 03, 2020		Building Materials	S20-Ma03587		X			
38	B7-A04	Mar 03, 2020		Building Materials	S20-Ma03588		X			
39	B7-A05	Mar 03, 2020		Building Materials	S20-Ma03589		X			
40	B7-A06	Mar 03, 2020		Building Materials	S20-Ma03618		X			
41	B1-AD01	Mar 03, 2020		Building Materials	S20-Ma03619		X			
42	B1-AD02	Mar 03, 2020		Dust	S20-Ma03620	X				
43	B2-AD01	Mar 03, 2020		Building Materials	S20-Ma03621		X			
44	B3-AD02	Mar 03, 2020		Dust	S20-Ma03622	X				
45	B3-AD03	Mar 03, 2020		Dust	S20-Ma03623	X				

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Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
46	B3-AD04	Mar 03, 2020		Dust	S20-Ma03624	X				
47	B4-AD01	Mar 03, 2020		Dust	S20-Ma03625	X				
48	B4-AD02	Mar 03, 2020		Dust	S20-Ma03626	X				
49	B5-AD01	Mar 03, 2020		Dust	S20-Ma03627	X				
50	B5-AD02	Mar 03, 2020		Dust	S20-Ma03628	X				
51	B5-AD03	Mar 03, 2020		Dust	S20-Ma03629	X				
52	B6-AD01	Mar 03, 2020		Dust	S20-Ma03630	X				
53	B7-AD01	Mar 03, 2020		Dust	S20-Ma03631	X				
54	B7-AD02	Mar 03, 2020		Dust	S20-Ma03632	X				
55	B1-LD01	Mar 03, 2020		Dust	S20-Ma03633				X	
56	B2-LD01	Mar 03, 2020		Dust	S20-Ma03634				X	
57	B3-LD01	Mar 03, 2020		Dust	S20-Ma03635				X	
58	B3-LD02	Mar 03, 2020		Dust	S20-Ma03636				X	

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 58140

Order No.:
Report #: 705518
Phone: 02 8245 0300
Fax:

Received: Mar 3, 2020 6:30 PM
Due: Mar 10, 2020
Priority: 5 Day
Contact Name: Stuart Lumsden

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	CANCELLED	Lead	Lead (% w/w)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
59	B3-LD03	Mar 03, 2020		Dust	S20-Ma03637				X	
60	B3-LD04	Mar 03, 2020		Dust	S20-Ma03638				X	
61	B4-LD01	Mar 03, 2020		Dust	S20-Ma03639				X	
62	B4-LD02	Mar 03, 2020		Dust	S20-Ma03640				X	
63	B5-LD01	Mar 03, 2020		Dust	S20-Ma03641				X	
64	B5-LD02	Mar 03, 2020		Dust	S20-Ma03642				X	
65	B5-LD03	Mar 03, 2020		Dust	S20-Ma03643				X	
66	B6-LD01	Mar 03, 2020		Dust	S20-Ma03644				X	
67	B7-LD01	Mar 03, 2020		Dust	S20-Ma03645				X	
68	B7-LD02	Mar 03, 2020		Dust	S20-Ma03646				X	
69	B1-LP01	Mar 03, 2020		Paint	S20-Ma03647					X
70	B1-LP02	Mar 03, 2020		Paint	S20-Ma03648					X
71	B1-LP03	Mar 03, 2020		Paint	S20-Ma03649					X

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
72	B1-LP04	Mar 03, 2020		Paint	S20-Ma03650					X
73	B2-LP01	Mar 03, 2020		Paint	S20-Ma03651					X
74	B2-LP02	Mar 03, 2020		Paint	S20-Ma03652					X
75	B3-LP01	Mar 03, 2020		Paint	S20-Ma03653					X
76	B3-LP02	Mar 03, 2020		Paint	S20-Ma03654					X
77	B3-LP03	Mar 03, 2020		Paint	S20-Ma03655					X
78	B4-LP01	Mar 03, 2020		Paint	S20-Ma03656					X
79	B4-LP02	Mar 03, 2020		Paint	S20-Ma03657					X
80	B5-LP01	Mar 03, 2020		Paint	S20-Ma03658					X
81	B5-LP02	Mar 03, 2020		Paint	S20-Ma03659					X
82	B5-LP03	Mar 03, 2020		Paint	S20-Ma03660					X
83	B5-LP04	Mar 03, 2020		Paint	S20-Ma03661					X
84	B6-LP01	Mar 03, 2020		Paint	S20-Ma03662					X

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
85	B6-LP02	Mar 03, 2020		Paint	S20-Ma03663					X
86	B6-LP03	Mar 03, 2020		Paint	S20-Ma03664					X
87	B6-LP04	Mar 03, 2020		Paint	S20-Ma03665					X
88	B6-LP05	Mar 03, 2020		Paint	S20-Ma03666					X
89	B7-LP01	Mar 03, 2020		Paint	S20-Ma03667					X
90	B7-LP02	Mar 03, 2020		Paint	S20-Ma03668			X		
91	B3-AD01	Mar 03, 2020		Dust	S20-Ma05678	X				
92	B2-LD02	Mar 03, 2020		Dust	S20-Ma05679				X	
Test Counts						13	42	1	15	21

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Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Authorised by:

Laxman Dias	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Stuart Lumsden**

Report **705518-S**
Project name PENRITH
Project ID 58140
Received Date Mar 03, 2020

Client Sample ID			**B1-LD01**	**B2-LD01**	**B3-LD01**	**B3-LD02**
Sample Matrix			**Dust**	**Dust**	**Dust**	**Dust**
Eurofins Sample No.			**S20-Ma03633**	**S20-Ma03634**	**S20-Ma03635**	**S20-Ma03636**
Date Sampled			**Mar 03, 2020**	**Mar 03, 2020**	**Mar 03, 2020**	**Mar 03, 2020**
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	540	380	120	210

Client Sample ID			**B3-LD03**	**B3-LD04**	**B4-LD01**	**B4-LD02**
Sample Matrix			**Dust**	**Dust**	**Dust**	**Dust**
Eurofins Sample No.			**S20-Ma03637**	**S20-Ma03638**	**S20-Ma03639**	**S20-Ma03640**
Date Sampled			**Mar 03, 2020**	**Mar 03, 2020**	**Mar 03, 2020**	**Mar 03, 2020**
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	140	680	220	140

Client Sample ID			**B5-LD01**	**B5-LD02**	**B5-LD03**	**B6-LD01**
Sample Matrix			**Dust**	**Dust**	**Dust**	**Dust**
Eurofins Sample No.			**S20-Ma03641**	**S20-Ma03642**	**S20-Ma03643**	**S20-Ma03644**
Date Sampled			**Mar 03, 2020**	**Mar 03, 2020**	**Mar 03, 2020**	**Mar 03, 2020**
Test/Reference	LOR	Unit				
Heavy Metals						
Lead	5	mg/kg	350	850	810	1300

Client Sample ID			**B7-LD01**	**B7-LD02**	**B1-LP01**	**B1-LP02**
Sample Matrix			**Dust**	**Dust**	**Paint**	**Paint**
Eurofins Sample No.			**S20-Ma03645**	**S20-Ma03646**	**S20-Ma03647**	**S20-Ma03648**
Date Sampled			**Mar 03, 2020**	**Mar 03, 2020**	**Mar 03, 2020**	**Mar 03, 2020**
Test/Reference	LOR	Unit				
Lead (% w/w)	0.01	%	-	-	1.3	0.02
Heavy Metals						
Lead	5	mg/kg	770	1300	-	-

Client Sample ID			B1-LP03	B1-LP04	B2-LP01	B2-LP02
Sample Matrix			Paint	Paint	Paint	Paint
Eurofins Sample No.			S20-Ma03649	S20-Ma03650	S20-Ma03651	S20-Ma03652
Date Sampled			Mar 03, 2020	Mar 03, 2020	Mar 03, 2020	Mar 03, 2020
Test/Reference	LOR	Unit				
Lead (% w/w)	0.01	%	0.12	0.22	0.10	< 0.01

Client Sample ID			B3-LP01	B3-LP02	B3-LP03	B4-LP01
Sample Matrix			Paint	Paint	Paint	Paint
Eurofins Sample No.			S20-Ma03653	S20-Ma03654	S20-Ma03655	S20-Ma03656
Date Sampled			Mar 03, 2020	Mar 03, 2020	Mar 03, 2020	Mar 03, 2020
Test/Reference	LOR	Unit				
Lead (% w/w)	0.01	%	< 0.01	0.17	0.06	0.04

Client Sample ID			B4-LP02	B5-LP01	B5-LP02	B5-LP03
Sample Matrix			Paint	Paint	Paint	Paint
Eurofins Sample No.			S20-Ma03657	S20-Ma03658	S20-Ma03659	S20-Ma03660
Date Sampled			Mar 03, 2020	Mar 03, 2020	Mar 03, 2020	Mar 03, 2020
Test/Reference	LOR	Unit				
Lead (% w/w)	0.01	%	0.03	3.6	0.71	0.08

Client Sample ID			B5-LP04	B6-LP01	B6-LP02	B6-LP03
Sample Matrix			Paint	Paint	Paint	Paint
Eurofins Sample No.			S20-Ma03661	S20-Ma03662	S20-Ma03663	S20-Ma03664
Date Sampled			Mar 03, 2020	Mar 03, 2020	Mar 03, 2020	Mar 03, 2020
Test/Reference	LOR	Unit				
Lead (% w/w)	0.01	%	0.12	0.06	0.39	0.05

Client Sample ID			B6-LP04	B6-LP05	B7-LP01	B2-LD02
Sample Matrix			Paint	Paint	Paint	Dust
Eurofins Sample No.			S20-Ma03665	S20-Ma03666	S20-Ma03667	S20-Ma05679
Date Sampled			Mar 03, 2020	Mar 03, 2020	Mar 03, 2020	Mar 03, 2020
Test/Reference	LOR	Unit				
Lead (% w/w)	0.01	%	0.04	0.04	0.16	-
Heavy Metals						
Lead	5	mg/kg	-	-	-	8900

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Lead (% w/w)	Sydney	Mar 09, 2020	6 Month
- Method: E022.5 - ACID EXTRACTABLE METALS IN PAINT IN LIQUID AND POWDERED FORM BY ICP-MS ANALYSIS			
Heavy Metals	Sydney	Mar 09, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

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Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	CANCELLED	Lead	Lead (% w/w)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
External Laboratory										
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
1	B1-A01	Mar 03, 2020		Building Materials	S20-Ma03541		X			
2	B1-A02	Mar 03, 2020		Building Materials	S20-Ma03542		X			
3	B1-A03	Mar 03, 2020		Building Materials	S20-Ma03543		X			
4	B1-A04	Mar 03, 2020		Building Materials	S20-Ma03544		X			
5	B1-A05	Mar 03, 2020		Building Materials	S20-Ma03545		X			
6	B1-A06	Mar 03, 2020		Building Materials	S20-Ma03546		X			

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
7	B1-A07	Mar 03, 2020		Building Materials	S20-Ma03547		X			
8	B2-A01	Mar 03, 2020		Building Materials	S20-Ma03548		X			
9	B2-A02	Mar 03, 2020		Building Materials	S20-Ma03549		X			
10	B2-A03	Mar 03, 2020		Building Materials	S20-Ma03550		X			
11	B3-A01	Mar 03, 2020		Building Materials	S20-Ma03551		X			
12	B3-A02	Mar 03, 2020		Building Materials	S20-Ma03552		X			
13	B3-A03	Mar 03, 2020		Building Materials	S20-Ma03553		X			
14	B3-A04	Mar 03, 2020		Building	S20-Ma03554		X			

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
				Materials						
15	B3-A05	Mar 03, 2020		Building Materials	S20-Ma03555		X			
16	B3-A06	Mar 03, 2020		Building Materials	S20-Ma03556		X			
17	B4-A01	Mar 03, 2020		Building Materials	S20-Ma03557		X			
18	B4-A02	Mar 03, 2020		Building Materials	S20-Ma03558		X			
19	B5-A01	Mar 03, 2020		Building Materials	S20-Ma03559		X			
20	B5-A02	Mar 03, 2020		Building Materials	S20-Ma03560		X			
21	B5-A03	Mar 03, 2020		Building Materials	S20-Ma03561		X			

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Project Name: PENRITH
Project ID: 58140

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Report #: 705518
Phone: 02 8245 0300
Fax:

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Due: Mar 10, 2020
Priority: 5 Day
Contact Name: Stuart Lumsden

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - AS4964	Asbestos Absence /Presence	CANCELLED	Lead	Lead (% w/w)
Melbourne Laboratory - NATA Site # 1254 & 14271										
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
22	B5-A04	Mar 03, 2020		Building Materials	S20-Ma03562		X			
23	B5-A05	Mar 03, 2020		Building Materials	S20-Ma03563		X			
24	B5-A06	Mar 03, 2020		Building Materials	S20-Ma03564		X			
25	B5-A07	Mar 03, 2020		Building Materials	S20-Ma03565		X			
26	B5-A08	Mar 03, 2020		Building Materials	S20-Ma03566		X			
27	B5-A09	Mar 03, 2020		Building Materials	S20-Ma03567		X			
28	B6-A01	Mar 03, 2020		Building Materials	S20-Ma03568		X			
29	B6-A02	Mar 03, 2020		Building	S20-Ma03569		X			

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
				Materials						
30	B6-A03	Mar 03, 2020		Building Materials	S20-Ma03570		X			
31	B6-A04	Mar 03, 2020		Building Materials	S20-Ma03571		X			
32	B6-A05	Mar 03, 2020		Building Materials	S20-Ma03572		X			
33	B6-A06	Mar 03, 2020		Building Materials	S20-Ma03583		X			
34	B6-A07	Mar 03, 2020		Building Materials	S20-Ma03584		X			
35	B7-A01	Mar 03, 2020		Building Materials	S20-Ma03585		X			
36	B7-A02	Mar 03, 2020		Building Materials	S20-Ma03586		X			

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
37	B7-A03	Mar 03, 2020		Building Materials	S20-Ma03587		X			
38	B7-A04	Mar 03, 2020		Building Materials	S20-Ma03588		X			
39	B7-A05	Mar 03, 2020		Building Materials	S20-Ma03589		X			
40	B7-A06	Mar 03, 2020		Building Materials	S20-Ma03618		X			
41	B1-AD01	Mar 03, 2020		Building Materials	S20-Ma03619		X			
42	B1-AD02	Mar 03, 2020		Dust	S20-Ma03620	X				
43	B2-AD01	Mar 03, 2020		Building Materials	S20-Ma03621		X			
44	B3-AD02	Mar 03, 2020		Dust	S20-Ma03622	X				
45	B3-AD03	Mar 03, 2020		Dust	S20-Ma03623	X				

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
46	B3-AD04	Mar 03, 2020		Dust	S20-Ma03624	X				
47	B4-AD01	Mar 03, 2020		Dust	S20-Ma03625	X				
48	B4-AD02	Mar 03, 2020		Dust	S20-Ma03626	X				
49	B5-AD01	Mar 03, 2020		Dust	S20-Ma03627	X				
50	B5-AD02	Mar 03, 2020		Dust	S20-Ma03628	X				
51	B5-AD03	Mar 03, 2020		Dust	S20-Ma03629	X				
52	B6-AD01	Mar 03, 2020		Dust	S20-Ma03630	X				
53	B7-AD01	Mar 03, 2020		Dust	S20-Ma03631	X				
54	B7-AD02	Mar 03, 2020		Dust	S20-Ma03632	X				
55	B1-LD01	Mar 03, 2020		Dust	S20-Ma03633				X	
56	B2-LD01	Mar 03, 2020		Dust	S20-Ma03634				X	
57	B3-LD01	Mar 03, 2020		Dust	S20-Ma03635				X	
58	B3-LD02	Mar 03, 2020		Dust	S20-Ma03636				X	

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
59	B3-LD03	Mar 03, 2020		Dust	S20-Ma03637				X	
60	B3-LD04	Mar 03, 2020		Dust	S20-Ma03638				X	
61	B4-LD01	Mar 03, 2020		Dust	S20-Ma03639				X	
62	B4-LD02	Mar 03, 2020		Dust	S20-Ma03640				X	
63	B5-LD01	Mar 03, 2020		Dust	S20-Ma03641				X	
64	B5-LD02	Mar 03, 2020		Dust	S20-Ma03642				X	
65	B5-LD03	Mar 03, 2020		Dust	S20-Ma03643				X	
66	B6-LD01	Mar 03, 2020		Dust	S20-Ma03644				X	
67	B7-LD01	Mar 03, 2020		Dust	S20-Ma03645				X	
68	B7-LD02	Mar 03, 2020		Dust	S20-Ma03646				X	
69	B1-LP01	Mar 03, 2020		Paint	S20-Ma03647					X
70	B1-LP02	Mar 03, 2020		Paint	S20-Ma03648					X
71	B1-LP03	Mar 03, 2020		Paint	S20-Ma03649					X

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Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
72	B1-LP04	Mar 03, 2020		Paint	S20-Ma03650					X
73	B2-LP01	Mar 03, 2020		Paint	S20-Ma03651					X
74	B2-LP02	Mar 03, 2020		Paint	S20-Ma03652					X
75	B3-LP01	Mar 03, 2020		Paint	S20-Ma03653					X
76	B3-LP02	Mar 03, 2020		Paint	S20-Ma03654					X
77	B3-LP03	Mar 03, 2020		Paint	S20-Ma03655					X
78	B4-LP01	Mar 03, 2020		Paint	S20-Ma03656					X
79	B4-LP02	Mar 03, 2020		Paint	S20-Ma03657					X
80	B5-LP01	Mar 03, 2020		Paint	S20-Ma03658					X
81	B5-LP02	Mar 03, 2020		Paint	S20-Ma03659					X
82	B5-LP03	Mar 03, 2020		Paint	S20-Ma03660					X
83	B5-LP04	Mar 03, 2020		Paint	S20-Ma03661					X
84	B6-LP01	Mar 03, 2020		Paint	S20-Ma03662					X

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Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
85	B6-LP02	Mar 03, 2020		Paint	S20-Ma03663					X
86	B6-LP03	Mar 03, 2020		Paint	S20-Ma03664					X
87	B6-LP04	Mar 03, 2020		Paint	S20-Ma03665					X
88	B6-LP05	Mar 03, 2020		Paint	S20-Ma03666					X
89	B7-LP01	Mar 03, 2020		Paint	S20-Ma03667					X
90	B7-LP02	Mar 03, 2020		Paint	S20-Ma03668			X		
91	B3-AD01	Mar 03, 2020		Dust	S20-Ma05678	X				
92	B2-LD02	Mar 03, 2020		Dust	S20-Ma05679				X	
Test Counts						13	42	1	15	21

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram | **mg/L:** milligrams per litre | **ug/L:** micrograms per litre

ppm: Parts per million | **ppb:** Parts per billion | **%:** Percentage

org/100mL: Organisms per 100 millilitres | **NTU:** Nephelometric Turbidity Units | **MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Lab Sample ID	QA Source	Units	Result 1	Result 2	RPD	Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Lead			mg/kg	< 5			5	Pass	
LCS - % Recovery									
Heavy Metals									
Lead			%	113			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Heavy Metals				Result 1					
Lead	S20-Ma05501	NCP	%	119			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	S20-Ma05499	NCP	mg/kg	7.5	6.8	10	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	N/A
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Ursula Long	Analytical Services Manager
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Version: 1, Version Date: 14/04/2021

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Appendix D Environmental Site Assessment Dry Cleaner 2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PRELIMINARY ENVIRONMENTAL SITE ASSESSMENT REPORT

134 – 138 Henry Street
Penrith, NSW 2750

Penrith City Council – August 2016

Geo-Logix
environment • geotech

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

DOCUMENT CONTROL

PRELIMINARY ENVIRONMENTAL SITE ASSESSMENT REPORT

134-138 Henry Street
Penrith, NSW 2750

PREPARED FOR

Penrith City Council
601 High Street
Penrith NSW 2751

Report reference: 1601069Rpt01FinalV01_12Aug16

Date: 12 August 2016

DISTRIBUTION AND REVISION REGISTER

Revision Number	Date	Description	Recipient	Deliverables
V01	12/08/2016	Final Report 1601069Rpt01FinalV01_12Aug16	Geo-Logix Pty Ltd	1 Electronic Copy
V01	12/08/2016	Final Report 1601069Rpt01FinalV01_12Aug16	Penrith City Council	1 Electronic Copy

Issued by: Geo-Logix Pty Ltd

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

EXECUTIVE SUMMARY

Geo-Logix Pty Ltd was engaged by Penrith City Council to conduct a Preliminary Environmental Site Assessment (ESA) of the property located at 134 - 138 Henry Street, Penrith NSW. The objective of the Preliminary ESA was to conduct a site inspection and collate site historical information in order to establish whether activities have occurred on site which may have resulted in contamination of land. As a portion of the site is occupied by a dry cleaning business, a preliminary assessment was undertaken to assess the presence / absence of contamination associated with operation of the dry cleaner.

The site is located within the Penrith CBD and is accessed by Henry Street from the north, Gaymark Lane to the east and Allen Place to the south. The site consists of two roughly rectangular lots, encompassing an area of 301 m^2. A two storey brick building occupies the entire site and is constructed on a concrete slab at grade. Potential asbestos containing material was observed in the building materials during the site inspection. At the time of inspection, the site was occupied by numerous businesses and shops on both levels. A dry cleaner currently occupies Shop 3, located on the corner of Henry Street and Gaymark Lane.

The review of historical data indicates the following site history:

- Prior to the 1950s, the site appeared to be a cleared, vacant property;
- The site was initially developed in the 1950s and appeared to be used for the stockpiling of unknown materials;
- The current building was constructed in the 1960s with title records noting various leases recorded for shops within the building since this time; and
- Council records indicate a dry cleaner has operated in Shop 3 since 1977.

To assess for ground contamination originating from dry cleaner activities, Geo-Logix installed two sub-slab passive soil vapour samplers beneath the dry cleaning store. The samplers were retrieved approximately 48 hours after deployment on 21 July 2016 and were transferred to NATA accredited SGS Leeder laboratories for analysis of VOCs.

Tetrachloroethene (PCE), historically used as a dry cleaning fluid at the site, was detected in soil beneath the dry cleaner shop at concentrations in excess of soil vapour assessment criteria for commercial land use. The highest concentrations were recorded in proximity to the location of the former dry cleaning machine. Trichloroethene (TCE) and cis-1.2 dichloroethene (DCE) were also detected in soil gas at concentrations greater than commercial land use criteria. TCE and DCE are degradation products of PCE.

Petroleum compounds benzene, xylenes and toluene were also detected in soil vapour at concentrations above laboratory reporting limits but below commercial land use criteria. The origin of the petroleum compounds is unknown.

An exceedence of soil vapour assessment criteria indicates potential exists for chemicals in the ground to migrate into indoor air of the overlying shops where they are inhaled by occupants at concentrations that can cause adverse health effects (vapour intrusion pathway). Further investigation would be required to determine if the vapour intrusion pathway exists.

Geo-Logix recommends a preliminary Conceptual Site Model (CSM) and Sampling Analysis Plan (SAP) is developed to identify potential receptors of contamination sourced from the dry cleaner and guide further assessment works to evaluate potential vapour intrusion risks. The CSM is a representation of site-related information regarding contamination sources and the pathways by which contaminants may migrate through various media and impact upon human and environmental receptors.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

The historical review and site inspection also identified the following potential sources of contamination at and in the vicinity of the site:

- Fill of unknown origin; and
- A former off-site service station across Gaymark Lane to the east.

Further investigation would be required to determine the presence or otherwise of such contamination.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

TABLE OF CONTENTS

1. INTRODUCTION 1

2. SITE INFORMATION 1

2.1 Site Identification 1

2.2 Site Zoning and Land Use 1

2.3 Site Description 1

2.4 Surrounding Land Use 2

2.5 Topography 2

2.6 Surface Water 2

2.7 Geology 2

2.8 Hydrogeology 2

2.9 Acid Sulphate Soils 3

2.10 Underground Utilities 3

3. PREVIOUS INVESTIGATIONS 3

4. SITE HISTORY 3

4.1 Title Search 4

4.2 Aerial Photograph Review 4

4.3 Liverpool Council Records 6

4.4 NSW WorkCover Dangerous Goods Licences 6

4.5 NSW OEH Contaminated Land Record 6

4.6 Protection of Environment Operations Act 1997 Public Register 6

4.7 NSW Contaminated Sites Notified to NSW EPA 7

4.8 Unexploded Ordinance 7

5. SITE HISTORY SUMMARY 7

6. POTENTIAL SITE CONTAMINATION 7

6.1 Dry Cleaners 7

6.2 Fill of Unknown Origin 8

6.3 Off-site Contamination Sources 8

7. SOIL VAPOUR ASSESSMENT 8

7.1 Soil Vapour Sampling Methodology 8

7.2 Assessment Criteria 9

7.3 Quality Assurance / Quality Control 10

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8. INVESTIGATION RESULTS 10
8.1 Site Geology 10
8.2 Soil Vapour Analytical Results 10
9. DISCUSSION 11
10. CONCLUSIONS AND RECOMMENDATIONS 11
11. LIMITATIONS 12
12. REFERENCES 14

FIGURES

Figure 1: Site Location Map

Figure 2: Site Map

Figure 3: Shop 3 Layout (1977) and Sampling Locations

ATTACHMENTS

Attachment A: Planning Certificate under Section 149(2, 5)

Attachment B: Photographic Plates

Attachment C: Groundwater Bore Search

Attachment D: Underground Utilities Plans

Attachment E: Title Documents

Attachment F: Aerial Photographs

Attachment G: Council Records

Attachment H: WorkCover NSW Records

Attachment I: NSW Office of Environment and Heritage Contaminated Land Record

Attachment J: Protection of Environment Operations Act 1997 Public Register

Attachment K: List of NSW Contaminated Sites Notified to NSW EPA

Attachment L: Unexploded Ordinance Record

Attachment M: Soil Vapour Field Sampling Logs

Attachment N: Laboratory Reports

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1. INTRODUCTION

Geo-Logix Pty Ltd (Geo-Logix) was engaged by Penrith City Council (Council) to conduct a Preliminary Environmental Site Assessment (ESA) of the property located at 134 - 138 Henry Street, Penrith NSW. (Figure 1).

The objective of the Preliminary ESA was to conduct a site inspection and collate site historical information in order to establish whether activities have occurred on site which may have resulted in contamination of land. As a portion of the site is occupied by a dry cleaning business, limited sampling was undertaken to assess the presence / absence of contamination associated operation of the dry cleaner.

The findings of the report are based on a review of historical site data, site inspection and limited sampling conducted on 19 July 2016.

2. SITE INFORMATION

2.1 Site Identification

The investigation area comprises the following properties:

Street Address	Lot and Deposited Plan (DP)	Approximate Area (m^2)
134-138 Henry Street, Penrith 2750	Lot 1 DP 252457 Lot 1 DP164798	301

2.2 Site Zoning and Land Use

Under Penrith Local Environment Plan (LEP) (2010), the site is zoned Commercial Core (B3). Planning and Development Certificates are provided in Attachment A.

2.3 Site Description

The following descriptions are based on a site inspection conducted by Geo-Logix on 19 July 2016. A photographic log is presented in Attachment B.

The site is located within a commercial area on the southern side of Henry Street, Penrith, NSW. The site consists of two roughly rectangular lots, encompassing an area of 301 m^2 (Figure 2). The site is accessed by Henry Street from the north, Gaymark Lane to the east and Allen Place to the south. A two storey brick building occupies the entire site and is constructed on a concrete slab at grade. A suspended awning extends around the front of the building with potential asbestos containing material observed in some building materials. At the time of inspection, the site was occupied by numerous businesses and shops on both levels.

Ground floor shops comprised the following:

- **Shop 1:** Shop 1, located on the corner of Gaymark Lane and Allen Place, was unoccupied at the time of the inspection but previously operated as a café. No obvious signs of contaminating activities were observed during the site inspection.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- **Shop 2:** Shop 2, located in the centre of the building, currently operates as a café. No obvious signs of contaminating activities were observed during the site inspection.
- **Shop 3**: Shop 3, located on the corner of Henry Street and Gaymark Lane, is currently occupied by a dry cleaner. The front portion of the shop contains the customer counter and index conveyor with clothes press, electric boiler and rotor cabinet located in the central and rear portion of the shop. Greg Nott of Raine and Horne Penrith, indicated the dry cleaning machine located in the south east corner of the shop was replaced in 2015. A cooling tower for the dry cleaning machine was located outside of the site. Various containers of dry cleaning chemicals were stored throughout the shop.

Upstairs businesses comprised a lawyer, education centre, health / therapy clinic and a small office space for a cleaning company. No contaminating activities in these offices were observed during the site inspection.

2.4 Surrounding Land Use

Based on observations during the site inspection and from aerial imagery, the surrounding land use comprised the following:

- **North** – Henry Street with a construction site beyond;
- **South** – Allen Place with a council carpark and commercial properties beyond;
- **East** – Gaymark Place with commercial properties beyond; and
- **West** – Commercial properties.

2.5 Topography

The site appears to have been levelled relative to surrounding topography which slopes slightly down towards the west.

2.6 Surface Water

The nearest surface water, located approximately 380 m south-west of the site, is a concrete line channel that drains to Peach Tree Creek.

2.7 Geology

Review of the NSW 1:100,000 Penrith Geological Map (Geological Survey of NSW, 1991) indicates the site is situated on the quaternary age Cranebrook formation characterised by gravel, sand, silt and clay.

2.8 Hydrogeology

It is expected that groundwater would follow the natural regional topography and generally flow west towards the Nepean River.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Reference to the NSW Water Groundwater Works Report (NSW Government, 2016) indicates there is one registered groundwater bore (GW111989) within a 500 m radius of the site. The bore is located at the service station on Worth Street, approximately 490 m west of the site and is registered for monitoring purposes. Groundwater was recorded from 7.5 to 9 meters below grade (mbg).

The groundwater bore map is presented in Attachment C.

2.9 Acid Sulphate Soils

The site is not located within an acid sulphate soil risk area.

2.10 Underground Utilities

A Dial Before You Dig search was conducted to determine the presence of underground utilities which may act as conduits for contamination migration both onsite and offsite (Attachment D). The plans indicate:

- Sydney Water utilities run below Henry Street along the northern site boundary and through the southern portion of the site;
- NBN utilities run underneath Henry Street and enter the site from the north;
- Optus utilities run below Henry Street to the north;
- Endeavour and Jemena services run below Henry Street to the north and Allen Place to the south; and
- Telstra utilities and PIPE Networks run underneath Henry Street and Gaymark Lane and enter the site from Gaymark Lane;

3. PREVIOUS INVESTIGATIONS

No previous environmental reports were provided to Geo-Logix at the time of reporting.

4. SITE HISTORY

The following information has been reviewed to determine historical land use and assess the likelihood of potentially contaminating activities having occurred at the site:

- Current and historical title deeds;
- Historical aerial photographs;
- Penrith Council Section 149 Planning Certificate and historical records;
- NSW WorkCover Dangerous Goods Licence records;
- NSW Office of Environment and Heritage (OEH) contaminated land database and public register for regulated contaminated sites;
- Protection of Environment Operations Act 1997 Public Register; and
- List of NSW Contaminated Sites Notified to OEH.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4.1 Title Search

A title deeds search was conducted through the Land Titles Office which is summarised below. Title documents are presented in Attachment E.

Period	Lot 1 DP 164798
1889 - 1947	Francis Henry Woodriff, gentleman
1947 - 1947	Charles William Owen Roberts, electrician
1947 - 1978	Geoffrey Howard Upton, boot repairer / retired garage proprietor
1978 - 2001	Various corporate owners, site uses not noted
2001 to Current	Penrith City Council (current owners)
Period	**Lot 1 DP 252457**
Prior to 1976	Crown Land
1976 - 1978	Geoffrey Howard Upton, boot repairer / garage proprietor
1978 - 2001	Various corporate owners, site uses not noted
2001 to Current	Penrith City Council (current owners)

A number of various leases are shown on title documents however activities undertaken by lessees could not be identified.

4.2 Aerial Photograph Review

Geo-Logix undertook a review of historical aerial photographs on record at the New South Wales Land and Property Management Authority. Photos were examined for the years 1943, 1956, 1965, 1975, 1986 and 1994. A Google Earth image was examined for the years 2004 and 2015. Photos are presented in Attachment F.

Aerial 1943

Area	Description
Site	The site is vacant and appears grassed.
Surroundings	A laneway runs along the rear of the site which is surrounded by vacant land with mixed residential and commercial properties.

Aerial 1956

Area	Description
Site	The site has been partially developed. The use of the site could not be determined but appears to have been partially fenced and material stockpiled within the fenced area. A possible concrete pad is located to the north of the fenced area.
Surroundings	A possible service station has been constructed to the east of the site with another commercial building constructed to the south of the service station. The commercial building appeared associated with the development on the subject site.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Aerial 1965

Area	Description
Site	The material stockpiles have been removed and the current building constructed.
Surroundings	The current carpark to the south of the site has been developed and additional bowsers observed at the service station to the east. An informal road passes between the site and the service station. The ground surface to on the adjacent lot to the west appeared disturbed.

Aerial 1975

Area	Description
Site	The site appears unchanged from the previous photograph.
Surroundings	Gaymark Lane has been formalised with the adjacent service station demolished and used as a car park. The current elevated carpark has been constructed to the south. The vacant lot to the west has been developed with a commercial building.

Aerial 1986

Area	Description
Site	The site appears unchanged from the previous photograph.
Surroundings	The former service station / carpark site to the east of Gaymark Lane has been developed into a commercial property

Aerial 1994

Area	Description
Site	The site appears unchanged from the previous photograph.
Surroundings	Surrounding land use appears similar to the previous photograph with the exception of a commercial high-rise constructed across Henry Street to the north.

Aerial 2004

Area	Description
Site	The site appears unchanged from the previous photograph.
Surroundings	Appears unchanged from the previous photograph.

Aerial 2016

Area	Description
Site	The site appears unchanged from the previous photograph.
Surroundings	Appears unchanged from the previous photograph.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4.3 Liverpool Council Records

Council Records

A search of Penrith Council records identified a number of historical development consents for the site. Council were unable to release the documents, with the exception of a site plan for the dry cleaner in Shop 3 (Attachment G), but provided the following summary:

Development Consent	Description	Date
DA15/0794	Use as an education centre and signage	14/09/2016
D8230 DA1	Occupation of existing premises of a refreshment room	23/10/2015
DA15/0565	Fit out & use as a café	03/07/2015
DA11/1027	Use as a Café	11/11/2011
20/15/2-F472	Dry Cleaners	08/09/1977
20/15/2-F448	Commercial Use	31/08/1977

Section 149 Planning Certificates

Review of Planning Certificates under Section 149 of the Environmental Planning and Assessment Act (1979) indicates the following for the site:

- The land is not proclaimed to be a mine subsidence district;
- Development on the land is subject to flood related development controls;
- Council has not been advised that the land is subject to any notifications under the Contaminated Land Management Act; and
- The land is affected by the Asbestos Policy adopted by council.

4.4 NSW WorkCover Dangerous Goods Licences

A search of the WorkCover Stored Chemical Information Database was undertaken to identify any dangerous goods storage licences held for the subject site. No records were identified the property. Search records are presented in Attachment H.

4.5 NSW OEH Contaminated Land Record

A review of the NSW OEH Contaminated Land Record established under Section 58 of the Contaminated Land Management Act 1997 found no records for the site or within 500 m. The search record is presented in Attachment I.

4.6 Protection of Environment Operations Act 1997 Public Register

A search of the public register established under Section 308 of the Protection of the Environment Operations Act 1997 (POEO Act) found no records for the site or within 500 m. The search record is presented in Attachment J.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4.7 NSW Contaminated Sites Notified to NSW EPA

A search of the List of NSW Contaminated Sites Notified to NSW EPA, found no records for the site or within 500 m. The search record is presented in Attachment K.

4.8 Unexploded Ordinance

A search of the Australian Department of Defence unexploded ordinance (UXO) register did not identify records for the site. The search record is presented in Attachment L.

5. SITE HISTORY SUMMARY

The review of historical data indicates the following site history:

- Prior to the 1950s, the site appeared to be a cleared, vacant property;
- The site was initially developed in the 1950s and appeared to be used for the stockpiling of unknown materials;
- The current building was constructed in the 1960s. Title records noting various leases recorded for shops within the property since this time; and
- Council records indicate a dry cleaner has operated in Shop 3 since 1977.

6. POTENTIAL SITE CONTAMINATION

A site inspection and review of the site history have identified the following potential contamination issues:

6.1 Dry Cleaners

Historical records indicate the shop in the northern portion of the site has operated as a drycleaners from 1977 to present. Potential exists for chlorinated hydrocarbon contamination to soil, groundwater and soil vapour originating from dry cleaning chemicals. The primary dry cleaning chemical perchloroethene (PCE) can biodegrade to trichloroethene (TCE), 1.2 dichloroethene (DCE), and vinyl chloride (VC). Due to the volatile nature of these chemicals, they can partition into a gas phase which can migrate into the indoor air of overlying buildings, the inhalation of which may potentially present a chronic health risk. Primary contaminants of potential concern (COPC) associated with dry cleaning operations include:

- PCE;
- TCE;
- DCE; and
- VC.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.2 Fill of Unknown Origin

In addition to minor levelling of the site, historical imagery indicates the site was used for the stockpiling of unknown material. As such, the presence of fill beneath the building cannot be ruled out. COPC associated with fill of unknown origin comprise:

- Total Recoverable Hydrocarbons (TRH);
- Benzene Toluene Ethylbenzene and Xylenes (BTEX);
- Organochlorine Pesticides (OCPs);
- Polychlorinated Biphenyls (PCBs);
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Heavy metals; and
- Asbestos

6.3 Off-site Contamination Sources

Aerial photographs indicate the property beyond Gaymark Lane to the east, previously operated as a service station from at least the 1950s to 1970s. The property was developed into commercial retail shop in the 1980s. Geo-Logix cannot rule out the potential for off-site contamination to have impacted the subject site without conducting further investigations given the history of underground petroleum storage on the adjacent property and the ability for petroleum to migrate across site boundaries either in soil, groundwater or soil vapour. COPC associated with service stations include:

- Petroleum hydrocarbons (TRH/BTEX)
- Polycyclic Aromatic Hydrocarbons (PAHs);
- Volatile Organic Hydrocarbons (VOCs); and
- Heavy Metals.

7. SOIL VAPOUR ASSESSMENT

A limited assessment of was undertaken to assess for ground contamination resulting from use of the site as a dry cleaners. On 19 July 2016, two sub-slab passive soil vapour samplers (SSV1 and SSV2) were installed below the concrete slab within the dry cleaning store. Passive gas samplers absorb evaporative organic contaminants at known uptake rates. Using the sample period and uptake rates the contaminant concentration in soil gas can be determined. Reported concentrations of soil gas can then be compared against health based screening levels.

7.1 Soil Vapour Sampling Methodology

Assessment for the presence of volatile contaminants beneath the dry cleaning shop was completed in accordance with the following methodology:

- After clearing underground services, the concrete slab was cut using a 25 mm diameter concrete core to access sub-slab soils. Sample location SSV1 was located adjacent to the

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

former dry cleaning machine with sample location SSV2 located in the central portion of the shop for general site coverage;

- Soil borings were advanced approximately 100 mm below the slab into the sub-slab fill using the 25 mm core barrel;
- Waterloo Membrane Passive Gas Samplers (WMS) lowered into each boring using string to approximately 50 mm from the bottom of the bore. The bottom of the samplers were fitted with a stainless steel wire coil to protect the membrane from contacting soil during deployment. Bores were sealed using a plastic film wrapped playdough as a plug to prevent atmospheric breakthrough;
- A field blank sample was deployed during the installation process to assess the concentration of COPC in ambient air within the shop. The results were used to determine if background concentrations in air in the shop could be up-taken by the passive samplers during installation; and
- Samplers were retrieved approximately 48 hours after deployment on 21 July 2016. Samplers were placed in plastic screw top bottles, sealed with Teflon tape and transferred under chain of custody to NATA accredited SGS Leeder laboratories for analysis of VOCs.

Soil vapour field sampling logs are presented in Attachment M.

7.2 Assessment Criteria

The primary reference for environmental site assessment in Australia is the Amended Assessment of Site Contamination (ASC) National Environmental Protection Measure (NEPM) 1999 (NEPC, as amended 2013). This document includes soil, soil vapour and groundwater criteria for use in evaluating potential contamination risk to human health and the environment.

The application of these investigation levels and screening levels is subject to a range of limitations and their selection and use must be in the context of the conceptual site model (CSM) relating to the nature and distribution of impacts and potential exposure pathways. Each relevant guideline is discussed further below and the adopted screening criteria are presented in summary sample analytical tables attached to this report.

NEPM (2013) Health Screening Levels D (HSLs D)

HSLs are Tier 1 risk based generic soil vapour assessment criteria used for the assessment of potential risks to human health from chronic inhalation exposure of subsurface petroleum vapours (Vapour Risk). They are intentionally conservative and based on a reasonable worst-case scenario for generic soil types, contamination depth and land use settings including Residential (HSLs A/B), Open Space / Recreational (HSLs C) and Commercial / Industrial (HSLs D).

HSLs D vapour assessment criteria for sand geology was adopted on the basis the site is commercial and material below the slab is likely to be bedding sands.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

NEPM (2013) Interim Soil Vapour Health Investigation Levels (HILs)

NEPM Interim soil vapour health investigation levels for chlorinated hydrocarbon chemicals are Tier 1 risk based generic soil vapour assessment criteria used for the assessment of potential risks to human health from chronic inhalation exposure of subsurface chlorinated hydrocarbon vapours (Vapour Risk). They are intentionally conservative and can be adopted for the purpose of screening sites where further investigation is required on a site specific basis under Residential (HSLs A / B), Open Space / Recreational (HSLs C) and Commercial / Industrial (HSLs D) exposure scenarios. Application of the interim HILs is based on measurement of shallow (<1 mbg) soil vapour or sub-slab vapour.

HILs D vapour assessment criteria was adopted on the basis the site is commercial.

7.3 Quality Assurance / Quality Control

Quality assurance procedures for soil vapour sampling included:

- Dedicated passive vapour sampler for each bore;
- Changing disposable gloves between sample locations;
- Placing samples immediately on ice following sampling; and
- Ensuring analysis was performed within recommended holding times.

Field QC sampling comprised the following:

Sample Identification	Sample Type	Sample Matrix	Rate of Collection
Blank	Field Blank	Soil Vapour	1 per Sampling Round

8. INVESTIGATION RESULTS

8.1 Site Geology

Due to the vapour sampler installation methodology used, the nature of material below the slab could not be determined.

8.2 Soil Vapour Analytical Results

Soil vapour analytical results are summarised in Table 1. Laboratory reports are presented in Attachment N.

VOCs

- PCE was detected at concentrations above the assessment criteria in soil vapour samples SSV1 and SSV2 (Table 1).
- TCE was detected at concentrations above the assessment criteria in soil vapour samples SSV1 and SSV2.
- Cis-1.2 DCE was detected at concentrations above the assessment criteria in soil vapour samples SSV1 and SSV2.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Trans-1.2 DCE was detected at concentrations above laboratory reporting limits in soil vapour samples from vapour well SSV1.
- Chloroform was detected at concentrations above laboratory reporting limits in soil vapour sample SSV1.
- Benzene, m&p xylenes and toluene were detected at concentrations above the laboratory reporting limits but below assessment criteria in soil vapour sample SSV1.

All other VOCs analysed were not detected at concentrations above laboratory reporting limits.

9. DISCUSSION

Dry cleaning chemical PCE, and its degradation products TCE and DCE, were detected at concentrations significantly greater than the assessment criteria in soil vapour beneath the concrete slab in Shop 3. The highest vapour concentrations were recorded in proximity to the former dry cleaning machine.

Petroleum compounds benzene, xylenes and toluene were also detected in soil vapour at concentrations above laboratory reporting limits but below commercial land use criteria. The origin of the petroleum compounds is unknown.

10. CONCLUSIONS AND RECOMMENDATIONS

Results of the historical review indicates the site and surrounds has had a history of commercial land use. Review of historical documents indicates that prior to 1950, the site was vacant before been used to stockpile unknown material. The current building was constructed in the 1960s and has been occupied by a number of business since this time. A dry cleaner has operated in Shop 3 from 1977.

Given the operation of dry cleaner in Shop 3, a limited soil vapour investigation was undertaken to determine the presence or otherwise of dry cleaning chemicals beneath the shop. PCE, a common dry cleaner solvent, and its degradation products TCE and DCE, were detected in soil vapour below the floor of the dry cleaner at concentrations in excess of commercial land use assessment criteria. PCE, TCE and DCE gas can migrate into indoor air of overlying buildings and potentially present a chronic inhalation health risk to building occupants. This process is referred to as vapour intrusion. Further investigation would be required to determine if the vapour intrusion pathway is complete and a potential risk of harm exists.

Geo-Logix recommends a preliminary Conceptual Site Model (CSM) and Sampling Analysis Plan (SAP) be developed to identify potential receptors of contamination and guide further assessment works to evaluate potential vapour intrusion risks. The CSM is a representation of site-related information regarding contamination sources and the pathways by which contaminants may migrate through various media and impact upon human and environmental receptors.

The historical review and site inspection also identified the following potential sources of contamination at the site:

- Fill of unknown origin; and
- A former off-site service station across Gaymark Lane to the east.

Further investigation would be required to determine the presence or otherwise of such contamination.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

11. LIMITATIONS

This report sets out the findings of a preliminary site investigation by Geo-Logix. A detailed site assessment is required before any conclusions may be drawn as to the:

- presence, identity and extent of specific substances, or
- suitability of the Site for any specific use, or category of use, or
- approvals, if any, that may be needed in respect of any use or category of use, or
- level of remediation, if any, that is warranted to render the Site suitable for any specific use, or category of use.

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The works undertaken by Geo-Logix are based solely on the scope of works, as agreed by the Client (**Scope of Works**). No other investigations, sampling, monitoring works or reporting will be carried out other than as expressly provided in the Scope of Works. **A COPY OF THE SCOPE OF WORKS IS AVAILABLE ON REQUEST.**

The conclusions stated in this report are based solely on the information, Scope of Works, analysis and data that are stated or expressly referred to in this report.

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Geo-Logix assumes no responsibility in respect of any changes in the condition of the Site which have occurred since the time when Geo-Logix gathered data and/or took samples from the Site on its site inspections dated **19 July 2015**.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Given the nature of asbestos, and the difficulties involved in identifying asbestos fibres, despite the exercise of all reasonable due care and diligence, thorough investigations may not always reveal its presence in either buildings or fill. Even if asbestos has been tested for and those tests' results do not reveal the presence of asbestos at those specific points of sampling, asbestos or asbestos containing materials may still be present at the Site, particularly if fill has been imported at any time, buildings constructed prior to 1970 have been demolished on the Site or materials from such buildings have been disposed of on the Site.

Geo-Logix has not investigated any off site conditions, including the extent if any to which substances in the Site may be emanating off Site, and if so whether any adjoining sites have been or may be impacted by contamination originating from the Site.

Geo-Logix has prepared this report with the diligence, care and skill which a reasonable person would expect from a reputable environmental consultancy and in accordance with environmental regulatory authority and industry standards, guidelines and assessment criteria applicable as at the date of this report. Industry standards and environmental criteria change frequently, and may change at any time after the date of this report.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

FIGURES

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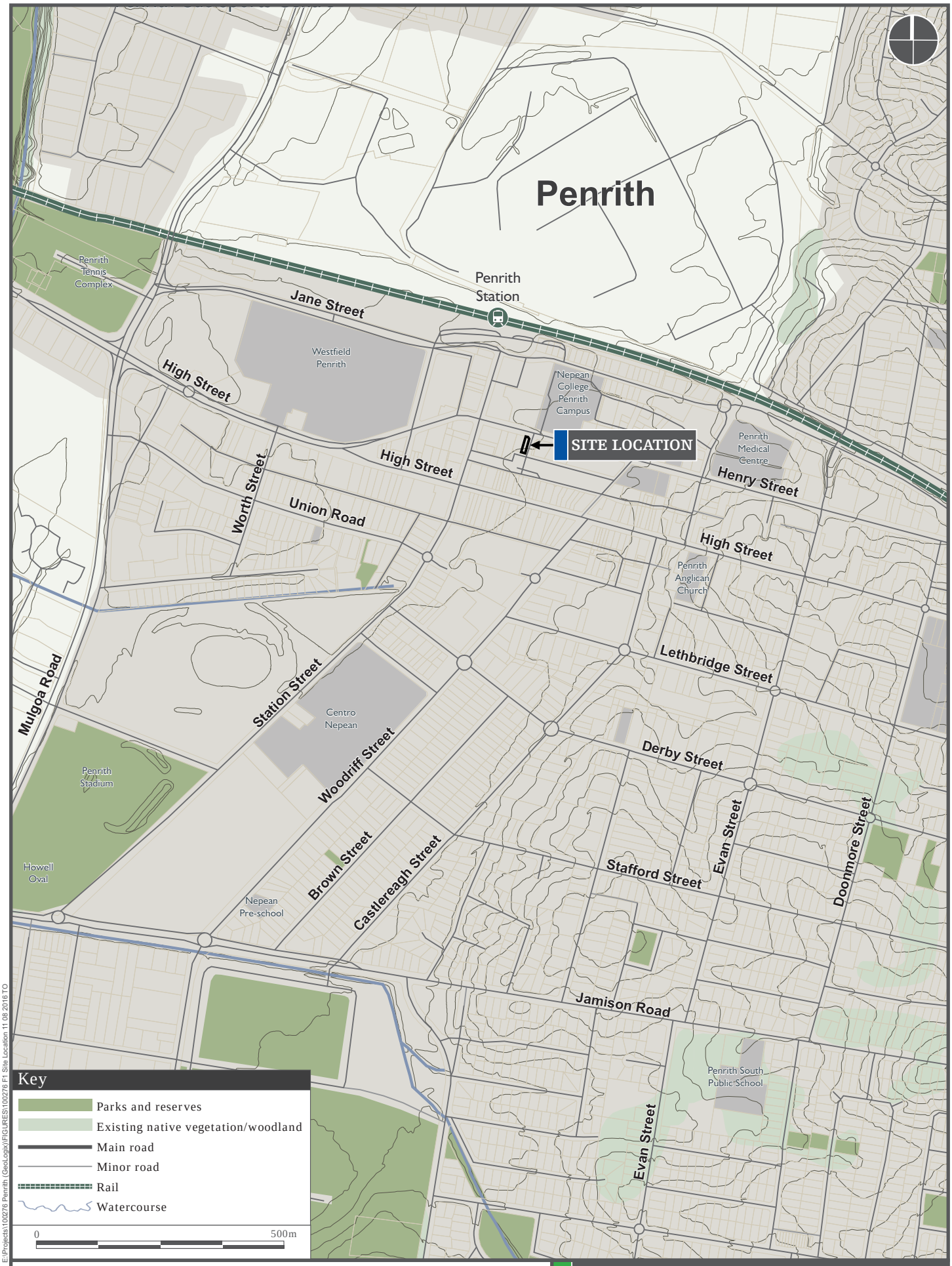

E:\Projects\100276 Penrith (GeoLogix)\FIGURES\100276 F1 Site Location 11 08 2016 TO

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SITE LOCATION

Preliminary Environmental Site Assessment
134 - 138 Henry Street, Penrith NSW

Project No. 1601069

Figure 1

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E:\Projects\100276 Penrith (GeoLogix\FIGURES\100276 F2 Site Plan 11 08 2016 TO

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SITE PLAN

Preliminary Environmental Site Assessment
134 - 138 Henry Street, Penrith NSW

Project No. 1601069

Figure 2

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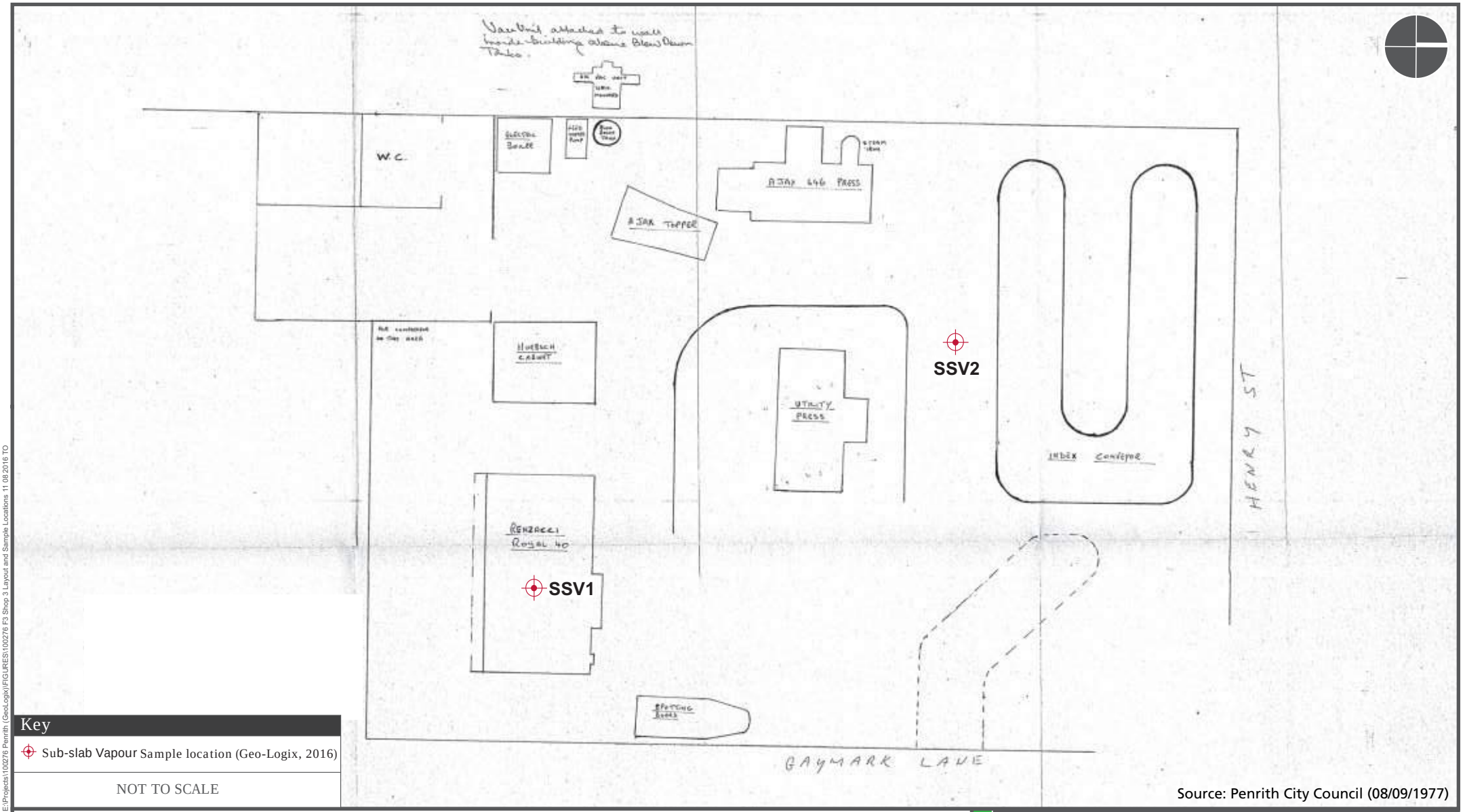

Source: Penrith City Council (08/09/1977)

Key

Sub-slab Vapour Sample location (Geo-Logix, 2016)

NOT TO SCALE

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SHOP 3 LAYOUT (1977) AND SAMPLE LOCATIONS

Preliminary Environmental Site Assessment
134 - 138 Henry Street, Penrith NSW

Project No. 1601069

Figure 3

E:\Projects\100276 Penrith (GeoLogix)\FIGURES\100276 F3 Shop 3 Layout and Sample Locations 11 08 2016 TO

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TABLES

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Table 1 : Summary of Soil Vapour Analytical Data - Volatile Organic Compounds

Preliminary Environmental Site Assessment

Project No.: 1601069

134 - 138 Henry Street

Penrith NSW

	Criteria 1	Criteria 2	Sample ID	SSV1	SSV2	Blank
	HILs - D	HSLs - D	Depth (m)	0.28	0.36	-
	Interim	Sand	Type	Fill	Fill	-
	Soil Vapour	0 to <1 m	Date	21/07/2016	21/07/2016	21/07/2016
1.1-Dichloroethane	-	-		< 0.066	< 0.067	< 0.067
1.1-Dichloroethene	-	-		< 0.078	< 0.078	< 0.078
1.1.1-Trichloroethane	230	-		< 0.051	< 0.052	< 0.052
1.1.1.2-Tetrachloroethane	-	-		--	--	--
1.1.2-Trichloroethane	-	-		< 0.02	< 0.02	< 0.02
1.1.2.2-Tetrachloroethane	-	-		--	--	--
1.2-Dibromoethane	-	-		--	--	--
1.2-Dichlorobenzene	-	-		< 0.0084	< 0.0084	< 0.0084
1.2-Dichloroethane	-	-		< 0.027	< 0.027	< 0.027
1.2-Dichloropropane	-	-		--	--	--
1.2.3-Trichloropropane	-	-		--	--	--
1.2.4-Trimethylbenzene	-	-		< 0.0098	< 0.0099	< 0.0099
1.3-Dichlorobenzene	-	-		< 0.0096	< 0.0097	< 0.0097
1.3-Dichloropropane	-	-		--	--	--
1.3.5-Trimethylbenzene	-	-		--	--	--
1.4-Dichlorobenzene	-	-		< 0.0094	< 0.0094	< 0.0095
2-Butanone (MEK)	-	-		< 0.051	< 0.052	< 0.052
2-Propanone (Acetone)	-	-		--	--	--
4-Chlorotoluene	-	-		--	--	--

Notes:

Criteria 1 = NEPC (1999) Amended, 'D' Commercial/industrial Interim soil vapour Health Investigation Levels for VOCCs.
Criteria 2 = NEPC (1999) Amended, 'D' Comm./ind. Soil vapour Health Screening Levels for vapour intrusion, sand 0 to <1m.
Total concentrations in mg/m³
- = assessment criteria not available
Blank = blanksample
< # or ND = analyte(s) not detected in excess of laboratory reporting limit
-- = sample not analysed
Bold/red indicates exceedance of assessment criteria

Table 1 : Summary of Soil Vapour Analytical Data - Volatile Organic Compounds

Preliminary Environmental Site Assessment

Project No.: 1601069

134 - 138 Henry Street

Penrith NSW

	Criteria 1	Criteria 2	Sample ID	SSV1	SSV2	Blank
	HILs - D	HSLs - D	Depth (m)	0.28	0.36	-
	Interim	Sand	Type	Fill	Fill	-
	Soil Vapour	0 to <1 m	Date	21/07/2016	21/07/2016	21/07/2016
4-Methyl-2-pentanone (MIBK)	-	-		--	--	--
Allyl chloride	-	-		--	--	--
Benzene	-	4		0.055	< 0.027	< 0.027
Bromobenzene	-	-		--	--	--
Bromochloromethane	-	-		--	--	--
Bromodichloromethane	-	-		--	--	--
Bromoform	-	-		--	--	--
Bromomethane	-	-		--	--	--
Carbon disulfide	-	-		--	--	--
Carbon Tetrachloride	-	-		< 0.042	< 0.042	< 0.042
Chlorobenzene	-	-		< 0.016	< 0.016	< 0.016
Chloroethane	-	-		--	--	--
Chloroform	-	-		0.11	< 0.033	< 0.034
Chloromethane	-	-		--	--	--
cis-1.2-Dichloroethene	0.3	-		**3**	< 0.034	< 0.034
cis-1.3-Dichloropropene	-	-		--	--	--
Dibromochloromethane	-	-		--	--	--
Dibromomethane	-	-		--	--	--
Dichlorodifluoromethane	-	-		< 0.35	< 0.35	< 0.35

Notes:

Criteria 1 = NEPC (1999) Amended, 'D' Commercial/industrial Interim soil vapour Health Investigation Levels for VOCCs.
Criteria 2 = NEPC (1999) Amended, 'D' Comm./ind. Soil vapour Health Screening Levels for vapour intrusion, sand 0 to <1m.
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134 - 138 Henry Street

Penrith NSW

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	HILs - D	HSLs - D	Depth (m)	0.28	0.36	-
	Interim	Sand	Type	Fill	Fill	-
	Soil Vapour	0 to <1 m	Date	21/07/2016	21/07/2016	21/07/2016
Ethylbenzene	-	1,300		< 0.014	< 0.014	< 0.014
Iodomethane	-	-		--	--	--
Isopropyl benzene (Cumene)	-	-		< 0.0069	< 0.0069	< 0.007
m&p-Xylenes	-	-		0.024	< 0.015	< 0.015
Methylene Chloride	-	-		--	--	--
o-Xylene	-	-		< 0.015	< 0.015	< 0.015
Styrene	-	-		--	--	--
Tetrachloroethene	8	-		**210**	**16**	< 0.016
Toluene	-	4,800		0.041	< 0.018	< 0.018
trans-1.2-Dichloroethene	-	-		0.51	< 0.035	< 0.035
trans-1.3-Dichloropropene	-	-		--	--	--
Trichloroethene	0.08	-		**6**	**0.35**	< 0.021
Trichlorofluoromethane	-	-		< 0.13	< 0.13	< 0.13
Vinyl chloride	0.1	-		< 0.13	< 0.13	< 0.13
Xylenes - Total	-	840		--	--	--

Notes:

Criteria 1 = NEPC (1999) Amended, 'D' Commercial/industrial Interim soil vapour Health Investigation Levels for VOCCs.
Criteria 2 = NEPC (1999) Amended, 'D' Comm./ind. Soil vapour Health Screening Levels for vapour intrusion, sand 0 to <1m.
Total concentrations in mg/m³
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-- = sample not analysed
Bold/red indicates exceedance of assessment criteria

ATTACHMENT A

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Plate 1. View north west of 134 - 138 Henry Street, Penrith from Allen Place.

Plate 2. View north, looking up Gaymark Lane. Subject site on the left. Former service station site on the right.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Plate 3. Coolant tower for dry cleaner, bins and empty chemical drums adjacent to Shop 3.

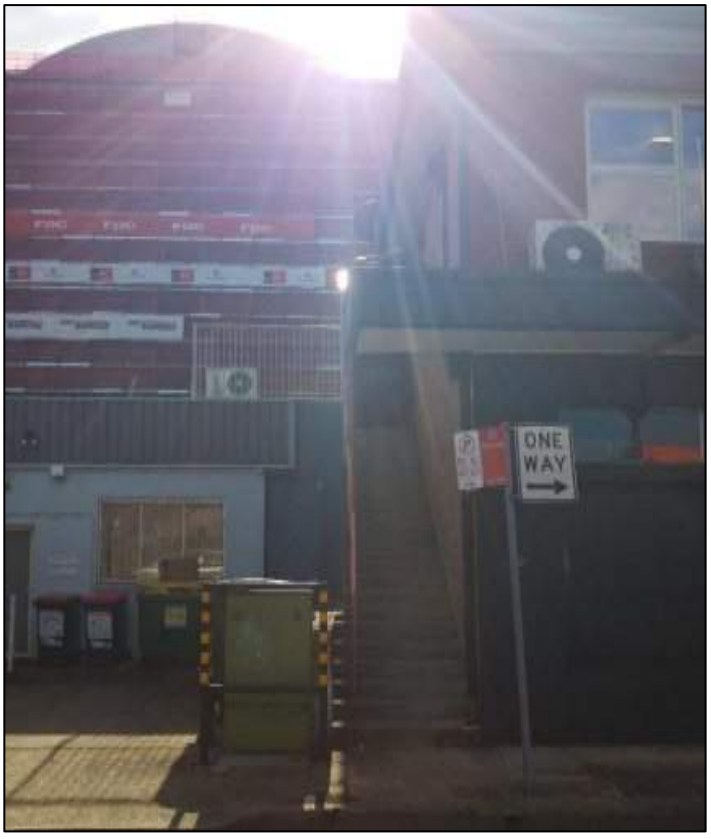

Plate 4. Rear of the building adjacent to Allen Place.

Plate 5. Inside of vacant Shop 1.

Plate 6. Rear portion of Shop 1.

Plate 7. Internal view of Shop 3.

Plate 8. View of the clothes press, rotor cupboard and dry cleaning machines within Shop 3.

Plate 9. Cleaning cupboard in the back of Shop 3 showing chemical storage.

Plate 10. Water Boiler within Shop 3.

Plate 11. Potential asbestos containing material showing signs of damage.

Plate 12. Potential asbestos containing material in the eaves of the building.

ATTACHMENT B

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Environmental Planning and Assessment Act, 1979

Property No: 319961
Your Reference: Penrith City Council PSI Post
Contact No: 99791722

Issue Date: 10/06/2016
Certificate No: 16/02821
Receipt Date: 8/06/2016
Receipt No: 2600810

Issued to: Tim Gunns
2309/4 Daydream Street
WARRIEWOOD NSW 2102

PRECINCT 2010

DESCRIPTION OF LAND

County: CUMBERLAND **Parish: CASTLEREAGH**

Location: 134-138 Henry Street PENRITH NSW 2750
Land Description: Lot 1 DP 164798

- PART 1 PRESCRIBED MATTERS –

In accordance with the provisions of Section 149(2) of the Act the following information is furnished in respect of the abovementioned land:

1 *NAMES OF RELEVANT PLANNING INSTRUMENTS AND DCPs*

1(1) The name of each environmental planning instrument that applies to the carrying out of development on the land:

Penrith Local Environmental Plan 2010, published 22nd September 2010, as amended, applies to the land.

Sydney Regional Environmental Plan No.9 - Extractive Industry (No.2), gazetted 15 September 1995, as amended, applies to the local government area of Penrith.

Sydney Regional Environmental Plan No. 20 - Hawkesbury-Nepean River (No. 2 - 1997), gazetted 7 November 1997, as amended, applies to the local government area of Penrith (except land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies).

The following State environmental planning policies apply to the land (subject to the exclusions noted below):
State Environmental Planning Policy No.1 - Development Standards. (Note: This policy does not apply to the land to which Penrith Local Environmental Plan 2010 or State Environmental Planning Policy (Western Sydney Employment Area) 2009 apply.)
State Environmental Planning Policy No.19 - Bushland in Urban Areas. (Note: This policy does not apply to certain land referred to in the National Parks and Wildlife Act 1974 and the Forestry Act 1916.)
State Environmental Planning Policy No.21 - Caravan Parks.
State Environmental Planning Policy No.30 - Intensive Agriculture.

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State Environmental Planning Policy No.32 - Urban Consolidation (Redevelopment of Urban Land). (Note: This policy does not apply to land identified as coastal protection, environmental protection, escarpment, floodway, natural hazard, non-urban, rural, rural residential, water catchment or wetland.)
State Environmental Planning Policy No.33 - Hazardous and Offensive Development.
State Environmental Planning Policy No.50 - Canal Estate Development. (Note: This policy does not apply to the land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies.
State Environmental Planning Policy No.55 - Remediation of Land.
State Environmental Planning Policy No.62 - Sustainable Aquaculture.
State Environmental Planning Policy No.64 - Advertising and Signage.
State Environmental Planning Policy No.65 - Design Quality of Residential Apartment Development.
State Environmental Planning Policy No.70 - Affordable Housing (Revised Schemes).
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 (Note: This policy applies to land within New South Wales that is land zoned primarily for urban purposes or land that adjoins land zoned primarily for urban purposes, but only as detailed in clause 4 of the policy.)
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004.
State Environmental Planning Policy (Major Development) 2005.
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.
State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007.
State Environmental Planning Policy (Infrastructure) 2007.
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.
State Environmental Planning Policy (Affordable Rental Housing) 2009.
State Environmental Planning Policy (State and Regional Development) 2011.

1(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act:

The Planning Proposal for Penrith City Park seeks to amend Penrith Local Environmental Plan 2010 to rezone certain land in Station Street and Henry Street to B4 Mixed Use to expand the range of land uses within the vicinity of the future Penrith City Park. See www.penrithcity.nsw.gov.au <http://www.penrithcity.nsw.gov.au> for more information.

Draft State Environmental Planning Policy (Infrastructure) Amendment (Shooting Ranges) 2013 applies to the land.

1(3) The name of each development control plan that applies to the carrying out of development on the land:

Penrith Development Control Plan 2014 applies to the land.

2 *ZONING AND LAND USE UNDER RELEVANT LEPs*

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone (however described):

2(a)-(d) the identity of the zone; the purposes that may be carried out without development consent; the purposes that may not be carried out except with development consent; and the purposes that are prohibited within the zone. Any zone(s) applying to the land is/are listed below and/or in annexures.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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(Note: If no zoning appears in this section see section 1(1) for zoning and land use details (under the Sydney Regional Environmental Plan or State Environmental Planning Policy that zones this property).)

Zone B3 Commercial Core
(Penrith Local Environmental Plan 2010)

1 Objectives of zone

- To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
- To encourage appropriate employment opportunities in accessible locations.
- To maximise public transport patronage and encourage walking and cycling.
- To strengthen the role of Penrith City Centre as the business, retail and cultural centre for the region.

2 Permitted without consent

Nil

3 Permitted with consent

Amusement centres; Car parks; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Function centres; Helipads; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads: Sex services premises; Signage; Tourist and visitor accommodation; Veterinary hospitals

4 Prohibited

Bed and breakfast accommodation; Farm stay accommodation; Any other development not specified in item 2 or 3

Flood planning

All or part of the subject land is identified in Penrith Local Environmental Plan 2010 (PLEP 2010) Clause 7.2 Flood Planning. Development consent is required for any development on land to which Clause 7.2 of PLEP 2010 applies.

Additional information relating to Penrith Local Environmental Plan 2010

Note 1: Under the terms of Clause 2.4 of Penrith Local Environmental Plan 2010 development may be carried out on unzoned land only with development consent.

Note 2: Under the terms of Clause 2.6 of Penrith Local Environmental Plan 2010 land may be subdivided but only with development consent, except for the exclusions detailed in the clause.

Note 3: Under the terms of Clause 2.7 of Penrith Local Environmental Plan 2010 the demolition of a building or work may be carried out only with development consent.

Note 4: A temporary use may be permitted with development consent subject to the requirements of Clause 2.8 of Penrith Local Environmental Plan 2010.

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Note 5: Under the terms of Clause 4.1A of Penrith Local Environmental Plan 2010, despite any other provision of this plan, development consent must not be granted for dual occupancy on an internal lot in Zone R2 Low Density Residential.

Note 6: Under the terms of Clause 5.1 of Penrith Local Environmental Plan 2010 development on land acquired by an authority of the State under the owner-initiated acquisition provisions may, before it is used for the purpose for which it is reserved, be carried out, with development consent, for any purpose.

Note 7: Under the terms of Clause 5.3 of Penrith Local Environmental Plan 2010 development consent may be granted to development of certain land for any purpose that may be carried out in an adjoining zone.

Note 8: Under the terms of Clause 5.9 of Penrith Local Environmental Plan 2010 trees or other vegetation subject to relevant sections of Penrith Development Control Plan 2014 must not be ringbarked, cut down, topped, lopped, removed, injured or wilfully destroyed without the authority conferred by a development consent or a Council permit.

Note 9: Under the terms of Clause 5.9AA of Penrith Local Environmental Plan 2010 (PLEP 2010) any tree or other vegetation that is not of a species or kind prescribed for the purposes of Clause 5.9 of PLEP 2010 by Penrith Development Control Plan 2014 may be ringbarked, cut down, topped, lopped, removed, injured or destroyed without development consent.

Note 10: Clause 5.10 of Penrith Local Environmental Plan 2010 details when development consent is required/not required in relation to heritage conservation.

Note 11: Under the terms of Clause 5.11 of Penrith Local Environmental Plan 2010 bush fire hazard reduction work authorised by the *Rural Fires Act 1997* may be carried out on any land without development consent.

Note 12: Under the terms of Clause 7.1 of Penrith Local Environmental Plan 2010 (PLEP 2010) development consent is required for earthworks unless the work is exempt development under PLEP 2010 or another applicable environmental planning instrument, or the work is ancillary to other development for which development consent has been given.

Note 13: Sex services premises and restricted premises may only be permitted subject to the requirements of Clause 7.23 of Penrith Local Environmental Plan 2010.

2(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed:

(Information is provided in this section only if any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed.)

2(f) whether the land includes or comprises critical habitat:

(Information is provided in this section only if the land includes or comprises critical habitat.)

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2(g) whether the land is in a conservation area (however described):

(Information is provided in this section only if the land is in a conservation area (however described).)

2(h) whether an item of environmental heritage (however described) is situated on the land:

(Information is provided in this section only if an item of environmental heritage (however described) is situated on the land.)

2A ZONING AND LAND USE UNDER STATE ENVIRONMENTAL PLANNING POLICY (SYDNEY REGION GROWTH CENTRES) 2006

(Information is provided in this section only if the land is within any zone under State Environmental Planning Policy (Sydney Region Growth Centres) 2006.)

3 COMPLYING DEVELOPMENT

GENERAL HOUSING CODE

(The General Housing Code only applies if the land is within Zones R1, R2, R3, R4 or RU5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the General Housing Code **may** be carried out on the land if the land is within one of the abovementioned zones.

RURAL HOUSING CODE

(The Rural Housing Code only applies if the land is within Zones RU1, RU2, RU3, RU4, RU6 or R5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the Rural Housing Code **may** be carried out on the land if the land is within one of the abovementioned zones.

HOUSING ALTERATIONS CODE

Complying development under the Housing Alterations Code **may** be carried out on the land.

GENERAL DEVELOPMENT CODE

Complying development under the General Development Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL ALTERATIONS CODE

Complying development under the Commercial and Industrial Alterations Code **may** be carried out on the land.

SUBDIVISIONS CODE

Complying development under the Subdivisions Code **may** be carried out on the land.

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PENRITH CITY COUNCIL

Civic Centre
601 High Street, Penrith

PO Box 60 Penrith NSW 2751

Telephone: 02 4732 7777
Facsimile: 02 4732 7958

Email: pencit@penrithcity.nsw.gov.au

PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

DEMOLITION CODE

Complying development under the Demolition Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL (NEW BUILDINGS AND ADDITIONS) CODE

(The Commercial and Industrial (New Buildings and Additions) Code only applies if the land is within Zones B1, B2, B3, B4, B5, B6, B7, B8, IN1, IN2, IN3, IN4 or SP3 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the Commercial and Industrial (New Buildings and Alterations) Code **may** be carried out on the land if the land is within one of the abovementioned zones.

FIRE SAFETY CODE

Complying development under the Fire Safety Code **may** be carried out on the land.

(NOTE: (1) Council has relied on Planning and Infrastructure Circulars and Fact Sheets in the preparation of this information. Applicants should seek their own legal advice in relation to this matter with particular reference to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

(2) Penrith Local Environmental Plan 2010 (if it applies to the land) contains additional complying development not specified in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.)

4 COASTAL PROTECTION

The land is not affected by the operation of sections 38 or 39 of the Coastal Protection Act 1979, to the extent that council has been so notified by the Department of Public Works.

5 MINE SUBSIDENCE

The land is not proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

6 ROAD WIDENING AND ROAD REALIGNMENT

The land is not affected by any road widening or road realignment under:
(a) Division 2 of Part 3 of the Roads Act 1993, or
(b) an environmental planning instrument, or
(c) a resolution of council.

7 COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS

(a) Council Policies
The land is affected by the Asbestos Policy adopted by Council.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

The land is not affected by any other policy adopted by the council that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

(b) Other Public Authority Policies

The Bush Fire Co-ordinating Committee has adopted a Bush Fire Risk Management Plan that covers the local government area of Penrith City Council, and includes public, private and Commonwealth lands.

The land is not affected by a policy adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council, that restricts the development of the land because of the likelihood of land slip, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

7A FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION

(1) Development on the land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) (if such uses are permissible on the land) is subject to flood related development controls.

(2) Development on the land or part of the land for industrial or commercial purposes (if such uses are permissible on the land) is subject to flood related development controls.

Development on the land or part of the land for purposes other than industrial or commercial, or for purposes other than those referred to in (1) above, will be considered on a merits based approach and flood related development controls may apply.

Note: The land is subject to Penrith Development Control Plan 2014 Section C3.5 Flood Planning. On application and payment of the prescribed fee Council may be able to provide in writing a range of advice in regard to the extent of flooding affecting the property.

8 LAND RESERVED FOR ACQUISITION

No environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

9 CONTRIBUTIONS PLANS

The Cultural Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith.

The Penrith City Local Open Space Development Contributions Plan 2007 applies anywhere residential development is permitted within the City of Penrith, excluding industrial areas and the release areas identified in Appendix B of the Plan (Penrith Lakes, Cranebrook, Sydney Regional Environmental Plan No. 30 - St Marys, Waterside, Thornton, the WELL Precinct, Glenmore Park and Erskine Park). See <http://www.penrithcity.nsw.gov.au/uploadedFiles/Content/Website/Our_Services/Planning_and_Development/Planning__Zoning_Information/Local_Planning_Documents/LocalOpenSpaceDCP(1).pdf>

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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The Penrith City District Open Space Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith, with the exclusion of industrial lands and the Penrith Lakes development site.

The Penrith City Centre Civic Improvement Plan applies to the land.

9A BIODIVERSITY CERTIFIED LAND

(Information is provided in this section only if the land is biodiversity certified land (within the meaning of Part 7AA of the *Threatened Species Conservation Act 1995*).)

10 BIOBANKING AGREEMENTS

(Information is provided in this section only if Council has been notified by the Director-General of the Department of Environment, Climate Change and Water that the land is land to which a biobanking agreement under Part 7A of the *Threatened Species Conservation Act 1995* relates.)

11 BUSH FIRE PRONE LAND

The land is not identified as bush fire prone land according to Council records.

12 PROPERTY VEGETATION PLANS

(Information is provided in this section only if Council has been notified that the land is land to which a property vegetation plan under the Native Vegetation Act 2003 applies.)

13 ORDERS UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006

(Information is provided in this section only if Council has been notified that an order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land.)

14 DIRECTIONS UNDER PART 3A

(Information is provided in this section only if there is a direction by the Minister in force under section 75P(2)(c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect.)

15 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS AFFECTING SENIORS HOUSING

(Information is provided in this section only if:

(a) there is a current site compatibility certificate (seniors housing), of which the council is aware, issued under State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

16 SITE COMPATIBILITY CERTIFICATES FOR INFRASTRUCTURE

(Information is provided in this section only if there is a valid site compatibility certificate (infrastructure), of which council is aware, in respect of proposed development on the land.)

17 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR AFFORDABLE RENTAL HOUSING

(Information is provided in this section only if:

(a) there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 17(1) or 37(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 have been imposed as a condition of consent to a development application in respect of the land.)

18 PAPER SUBDIVISION INFORMATION

(Information is provided in this section only if a development plan adopted by a relevant authority applies to the land or is proposed to be subject to a consent ballot, or a subdivision order applies to the land.)

19 SITE VERIFICATION CERTIFICATES

(Information is provided in this section only if there is a current site verification certificate, of which council is aware, in respect of the land.)

NOTE: The following matters are prescribed by section 59(2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate

(a) (Information is provided in this section only if, as at the date of this certificate, the land (or part of the land) is significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.)

(b) (Information is provided in this section only if, as at the date of this certificate, the land is subject to a management order within the meaning of the Contaminated Land Management Act 1997.)

(c) (Information is provided in this section only if, as at the date of this certificate, the land is the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.)

(d) (Information is provided in this section only if, at the date of this certificate, the land subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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(e) (Information is provided in this section only if the land is the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997 – a copy of which has been provided to Council.)

Note: Section 149(5) information for this property may contain additional information regarding contamination issues.

Note: The Environmental Planning and Assessment Amendment Act 1997 commenced operation on the 1 July 1998. As a consequence of this Act the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment (Amendment) Regulation 1998, Environmental Planning and Assessment (Further Amendment) Regulation 1998 and Environmental Planning and Assessment (Savings and Transitional) Regulation 1998 and Environmental Planning and Assessment Regulation 2000.

Information is provided only to the extent that Council has been notified by relevant government departments.

149(5) Certificate
This Certificate is directed to the following relevant matters affecting the land

When information pursuant to section 149(5) is requested the Council is under no obligation to furnish any of the information supplied herein pursuant to that section. Council draws your attention to section 149(6) which states that a council shall not incur any liability in respect of any advice provided in good faith pursuant to sub-section (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate.

Note:

- Council's 149(5) information does not include development consent or easement information. Details of development consents may be obtained by making enquiries with Council's Development Services Department pursuant to section 12 of the Local Government Act 1993 or (for development applications lodged after January 2007) by viewing the Online Services area at www.penrithcity.nsw.gov.au . Details of any easements may be obtained from a Title Search at Land and Property Information New South Wales.
- This certificate does not contain information relating to Complying Development Certificates.
- This certificate may not provide full details of development rights over the land.

* Threatened Species Conservation Act 1995
When considering any development application Council must have regard to the Threatened Species Conservation Act 1995. Please note that this legislation may have application to any land throughout the city. Interested persons should make their own enquiries in regard to the impact that this legislation could have on this land.

* Preservation of Trees and Vegetation
See Clauses 5.9 and 5.9AA of Penrith Local Environmental Plan 2010 and Chapter C2 of Penrith Development Control Plan 2014 for specific controls relating to the preservation of trees and vegetation.

* Development Control Plan General Information
Penrith Development Control Plan 2014 which applies to the land, sets out requirements for a range of issues that apply across the Penrith Local Government Area, including:

- Site Planning and Design Principles

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Vegetation Management
- Water Management
- Land Management
- Waste Management
- Landscape Design
- Culture and Heritage
- Public Domain
- Advertising and Signage
- Transport, Access and Parking
- Subdivision
- Noise and Vibration, and
- Infrastructure and Services.

The Development Control Plan also specifies requirements relating to various types of land uses including:

- Rural Land Uses
- Residential Development
- Commercial and Retail Development, and
- Industrial Development

as well as for a number of specific activities, including child care centres; health consulting rooms; educational establishments; parent friendly amenities; places of public worship; vehicle repair stations; cemeteries, crematoria and funeral homes; extractive industries; and telecommunication facilities.
The Development Control Plan also details requirements relating to key precincts within the Penrith Local Government Area, including:

- Caddens
- Claremont Meadows Stage 2
- Cranebrook
- Emu Heights
- Emu Plains
- Erskine Business Park
- Glenmore Park
- Kingswood
- Mulgoa Valley
- Orchard Hills
- Penrith
- Penrith Health and Education Precinct
- Riverlink Precinct
- St Clair, and
- St Marys / St Marys North.

Penrith Development Control Plan 2014 may be accessed at https://www.penrithcity.nsw.gov.au/Building-and-Development/Planning-and-Zoning/Planning-Controls/Development-Control-Plans/

* Penrith City Centre Controls

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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See Part 8 of Penrith Local Environmental Plan 2010 and Chapter E11 of Penrith Development Control Plan 2014 for specific controls relating to Penrith City Centre (which includes the subject property).

* Active Street Frontage

The land is identified as an "Active Street Frontage" on the Penrith Local Environmental Plan 2010 (PLEP 2010) Active Street Frontages Map. See Clause 7.8 of PLEP 2010 for details.

Alan Stoneham
General Manager

PER

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

Property No: 319961
Your Reference: Penrith Council PS1 Post
Contact No: 99791722

Issue Date: 10/06/2016
Certificate No: 16/02832
Receipt Date: 8/06/2016
Receipt No: 2600810

Issued to: Tim Gunns
2309/4 Daydream St
WARRIEWOOD NSW 2102

PRECINCT 2010

DESCRIPTION OF LAND

County: CUMBERLAND **Parish: CASTLEREAGH**

Location: 134-138 Henry Street PENRITH NSW 2750
Land Description: Lot 1 DP 252457

- PART 1 PRESCRIBED MATTERS –

In accordance with the provisions of Section 149(2) of the Act the following information is furnished in respect of the abovementioned land:

1 *NAMES OF RELEVANT PLANNING INSTRUMENTS AND DCPs*

1(1) The name of each environmental planning instrument that applies to the carrying out of development on the land:

Penrith Local Environmental Plan 2010, published 22nd September 2010, as amended, applies to the land.

Sydney Regional Environmental Plan No.9 - Extractive Industry (No.2), gazetted 15 September 1995, as amended, applies to the local government area of Penrith.

Sydney Regional Environmental Plan No. 20 - Hawkesbury-Nepean River (No. 2 - 1997), gazetted 7 November 1997, as amended, applies to the local government area of Penrith (except land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies).

The following State environmental planning policies apply to the land (subject to the exclusions noted below):
State Environmental Planning Policy No.1 - Development Standards. (Note: This policy does not apply to the land to which Penrith Local Environmental Plan 2010 or State Environmental Planning Policy (Western Sydney Employment Area) 2009 apply.)
State Environmental Planning Policy No.19 - Bushland in Urban Areas. (Note: This policy does not apply to certain land referred to in the National Parks and Wildlife Act 1974 and the Forestry Act 1916.)
State Environmental Planning Policy No.21 - Caravan Parks.
State Environmental Planning Policy No.30 - Intensive Agriculture.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Environmental Planning and Assessment Act, 1979

State Environmental Planning Policy No.32 - Urban Consolidation (Redevelopment of Urban Land). (Note: This policy does not apply to land identified as coastal protection, environmental protection, escarpment, floodway, natural hazard, non-urban, rural, rural residential, water catchment or wetland.)
State Environmental Planning Policy No.33 - Hazardous and Offensive Development.
State Environmental Planning Policy No.50 - Canal Estate Development. (Note: This policy does not apply to the land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies.
State Environmental Planning Policy No.55 - Remediation of Land.
State Environmental Planning Policy No.62 - Sustainable Aquaculture.
State Environmental Planning Policy No.64 - Advertising and Signage.
State Environmental Planning Policy No.65 - Design Quality of Residential Apartment Development.
State Environmental Planning Policy No.70 - Affordable Housing (Revised Schemes).
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 (Note: This policy applies to land within New South Wales that is land zoned primarily for urban purposes or land that adjoins land zoned primarily for urban purposes, but only as detailed in clause 4 of the policy.)
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004.
State Environmental Planning Policy (Major Development) 2005.
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.
State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007.
State Environmental Planning Policy (Infrastructure) 2007.
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.
State Environmental Planning Policy (Affordable Rental Housing) 2009.
State Environmental Planning Policy (State and Regional Development) 2011.

1(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act:

The Planning Proposal for Penrith City Park seeks to amend Penrith Local Environmental Plan 2010 to rezone certain land in Station Street and Henry Street to B4 Mixed Use to expand the range of land uses within the vicinity of the future Penrith City Park. See www.penrithcity.nsw.gov.au <http://www.penrithcity.nsw.gov.au> for more information.

Draft State Environmental Planning Policy (Infrastructure) Amendment (Shooting Ranges) 2013 applies to the land.

1(3) The name of each development control plan that applies to the carrying out of development on the land:

Penrith Development Control Plan 2014 applies to the land.

2 *ZONING AND LAND USE UNDER RELEVANT LEPs*

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone (however described):

2(a)-(d) the identity of the zone; the purposes that may be carried out without development consent; the purposes that may not be carried out except with development consent; and the purposes that are prohibited within the zone. Any zone(s) applying to the land is/are listed below and/or in annexures.

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(Note: If no zoning appears in this section see section 1(1) for zoning and land use details (under the Sydney Regional Environmental Plan or State Environmental Planning Policy that zones this property).)

Zone B3 Commercial Core
(Penrith Local Environmental Plan 2010)

1 Objectives of zone

- To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
- To encourage appropriate employment opportunities in accessible locations.
- To maximise public transport patronage and encourage walking and cycling.
- To strengthen the role of Penrith City Centre as the business, retail and cultural centre for the region.

2 Permitted without consent

Nil

3 Permitted with consent

Amusement centres; Car parks; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Function centres; Helipads; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads: Sex services premises; Signage; Tourist and visitor accommodation; Veterinary hospitals

4 Prohibited

Bed and breakfast accommodation; Farm stay accommodation; Any other development not specified in item 2 or 3

Flood planning

All or part of the subject land is identified in Penrith Local Environmental Plan 2010 (PLEP 2010) Clause 7.2 Flood Planning. Development consent is required for any development on land to which Clause 7.2 of PLEP 2010 applies.

Additional information relating to Penrith Local Environmental Plan 2010

Note 1: Under the terms of Clause 2.4 of Penrith Local Environmental Plan 2010 development may be carried out on unzoned land only with development consent.

Note 2: Under the terms of Clause 2.6 of Penrith Local Environmental Plan 2010 land may be subdivided but only with development consent, except for the exclusions detailed in the clause.

Note 3: Under the terms of Clause 2.7 of Penrith Local Environmental Plan 2010 the demolition of a building or work may be carried out only with development consent.

Note 4: A temporary use may be permitted with development consent subject to the requirements of Clause 2.8 of Penrith Local Environmental Plan 2010.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

Note 5: Under the terms of Clause 4.1A of Penrith Local Environmental Plan 2010, despite any other provision of this plan, development consent must not be granted for dual occupancy on an internal lot in Zone R2 Low Density Residential.

Note 6: Under the terms of Clause 5.1 of Penrith Local Environmental Plan 2010 development on land acquired by an authority of the State under the owner-initiated acquisition provisions may, before it is used for the purpose for which it is reserved, be carried out, with development consent, for any purpose.

Note 7: Under the terms of Clause 5.3 of Penrith Local Environmental Plan 2010 development consent may be granted to development of certain land for any purpose that may be carried out in an adjoining zone.

Note 8: Under the terms of Clause 5.9 of Penrith Local Environmental Plan 2010 trees or other vegetation subject to relevant sections of Penrith Development Control Plan 2014 must not be ringbarked, cut down, topped, lopped, removed, injured or wilfully destroyed without the authority conferred by a development consent or a Council permit.

Note 9: Under the terms of Clause 5.9AA of Penrith Local Environmental Plan 2010 (PLEP 2010) any tree or other vegetation that is not of a species or kind prescribed for the purposes of Clause 5.9 of PLEP 2010 by Penrith Development Control Plan 2014 may be ringbarked, cut down, topped, lopped, removed, injured or destroyed without development consent.

Note 10: Clause 5.10 of Penrith Local Environmental Plan 2010 details when development consent is required/not required in relation to heritage conservation.

Note 11: Under the terms of Clause 5.11 of Penrith Local Environmental Plan 2010 bush fire hazard reduction work authorised by the *Rural Fires Act 1997* may be carried out on any land without development consent.

Note 12: Under the terms of Clause 7.1 of Penrith Local Environmental Plan 2010 (PLEP 2010) development consent is required for earthworks unless the work is exempt development under PLEP 2010 or another applicable environmental planning instrument, or the work is ancillary to other development for which development consent has been given.

Note 13: Sex services premises and restricted premises may only be permitted subject to the requirements of Clause 7.23 of Penrith Local Environmental Plan 2010.

2(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed:

(Information is provided in this section only if any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed.)

2(f) whether the land includes or comprises critical habitat:

(Information is provided in this section only if the land includes or comprises critical habitat.)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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2(g) whether the land is in a conservation area (however described):

(Information is provided in this section only if the land is in a conservation area (however described).)

2(h) whether an item of environmental heritage (however described) is situated on the land:

(Information is provided in this section only if an item of environmental heritage (however described) is situated on the land.)

2A ZONING AND LAND USE UNDER STATE ENVIRONMENTAL PLANNING POLICY (SYDNEY REGION GROWTH CENTRES) 2006

(Information is provided in this section only if the land is within any zone under State Environmental Planning Policy (Sydney Region Growth Centres) 2006.)

3 COMPLYING DEVELOPMENT

GENERAL HOUSING CODE
(The General Housing Code only applies if the land is within Zones R1, R2, R3, R4 or RU5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the General Housing Code **may** be carried out on the land if the land is within one of the abovementioned zones.

RURAL HOUSING CODE
(The Rural Housing Code only applies if the land is within Zones RU1, RU2, RU3, RU4, RU6 or R5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the Rural Housing Code **may** be carried out on the land if the land is within one of the abovementioned zones.

HOUSING ALTERATIONS CODE

Complying development under the Housing Alterations Code **may** be carried out on the land.

GENERAL DEVELOPMENT CODE

Complying development under the General Development Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL ALTERATIONS CODE

Complying development under the Commercial and Industrial Alterations Code **may** be carried out on the land.

SUBDIVISIONS CODE

Complying development under the Subdivisions Code **may** be carried out on the land.

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Version: 1, Version Date: 14/04/2021

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DEMOLITION CODE

Complying development under the Demolition Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL (NEW BUILDINGS AND ADDITIONS) CODE

(The Commercial and Industrial (New Buildings and Additions) Code only applies if the land is within Zones B1, B2, B3, B4, B5, B6, B7, B8, IN1, IN2, IN3, IN4 or SP3 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the Commercial and Industrial (New Buildings and Alterations) Code **may** be carried out on the land if the land is within one of the abovementioned zones.

FIRE SAFETY CODE

Complying development under the Fire Safety Code **may** be carried out on the land.

(NOTE: (1) Council has relied on Planning and Infrastructure Circulars and Fact Sheets in the preparation of this information. Applicants should seek their own legal advice in relation to this matter with particular reference to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

(2) Penrith Local Environmental Plan 2010 (if it applies to the land) contains additional complying development not specified in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.)

4 COASTAL PROTECTION

The land is not affected by the operation of sections 38 or 39 of the Coastal Protection Act 1979, to the extent that council has been so notified by the Department of Public Works.

5 MINE SUBSIDENCE

The land is not proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

6 ROAD WIDENING AND ROAD REALIGNMENT

The land is not affected by any road widening or road realignment under:
(a) Division 2 of Part 3 of the Roads Act 1993, or
(b) an environmental planning instrument, or
(c) a resolution of council.

7 COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS

(a) Council Policies
The land is affected by the Asbestos Policy adopted by Council.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

The land is not affected by any other policy adopted by the council that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

(b) Other Public Authority Policies

The Bush Fire Co-ordinating Committee has adopted a Bush Fire Risk Management Plan that covers the local government area of Penrith City Council, and includes public, private and Commonwealth lands.

The land is not affected by a policy adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council, that restricts the development of the land because of the likelihood of land slip, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

7A FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION

(1) Development on the land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) (if such uses are permissible on the land) is subject to flood related development controls.

(2) Development on the land or part of the land for industrial or commercial purposes (if such uses are permissible on the land) is subject to flood related development controls.

Development on the land or part of the land for purposes other than industrial or commercial, or for purposes other than those referred to in (1) above, will be considered on a merits based approach and flood related development controls may apply.

Note: The land is subject to Penrith Development Control Plan 2014 Section C3.5 Flood Planning. On application and payment of the prescribed fee Council may be able to provide in writing a range of advice in regard to the extent of flooding affecting the property.

8 LAND RESERVED FOR ACQUISITION

No environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

9 CONTRIBUTIONS PLANS

The Cultural Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith.

The Penrith City Local Open Space Development Contributions Plan 2007 applies anywhere residential development is permitted within the City of Penrith, excluding industrial areas and the release areas identified in Appendix B of the Plan (Penrith Lakes, Cranebrook, Sydney Regional Environmental Plan No. 30 - St Marys, Waterside, Thornton, the WELL Precinct, Glenmore Park and Erskine Park). See <http://www.penrithcity.nsw.gov.au/uploadedFiles/Content/Website/Our_Services/Planning_and_Development/Planning__Zoning_Information/Local_Planning_Documents/LocalOpenSpaceDCP(1).pdf>

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PENRITH CITY COUNCIL

Civic Centre
601 High Street, Penrith

PO Box 60 Penrith NSW 2751

Telephone: 02 4732 7777
Facsimile: 02 4732 7958

Email: pencit@penrithcity.nsw.gov.au

The Penrith City District Open Space Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith, with the exclusion of industrial lands and the Penrith Lakes development site.

The Penrith City Centre Civic Improvement Plan applies to the land.

9A BIODIVERSITY CERTIFIED LAND

(Information is provided in this section only if the land is biodiversity certified land (within the meaning of Part 7AA of the *Threatened Species Conservation Act 1995*).)

10 BIOBANKING AGREEMENTS

(Information is provided in this section only if Council has been notified by the Director-General of the Department of Environment, Climate Change and Water that the land is land to which a biobanking agreement under Part 7A of the *Threatened Species Conservation Act 1995* relates.)

11 BUSH FIRE PRONE LAND

The land is not identified as bush fire prone land according to Council records.

12 PROPERTY VEGETATION PLANS

(Information is provided in this section only if Council has been notified that the land is land to which a property vegetation plan under the Native Vegetation Act 2003 applies.)

13 ORDERS UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006

(Information is provided in this section only if Council has been notified that an order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land.)

14 DIRECTIONS UNDER PART 3A

(Information is provided in this section only if there is a direction by the Minister in force under section 75P(2)(c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect.)

15 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS AFFECTING SENIORS HOUSING

(Information is provided in this section only if:

(a) there is a current site compatibility certificate (seniors housing), of which the council is aware, issued under State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

16 SITE COMPATIBILITY CERTIFICATES FOR INFRASTRUCTURE

(Information is provided in this section only if there is a valid site compatibility certificate (infrastructure), of which council is aware, in respect of proposed development on the land.)

17 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR AFFORDABLE RENTAL HOUSING

(Information is provided in this section only if:

(a) there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 17(1) or 37(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 have been imposed as a condition of consent to a development application in respect of the land.)

18 PAPER SUBDIVISION INFORMATION

(Information is provided in this section only if a development plan adopted by a relevant authority applies to the land or is proposed to be subject to a consent ballot, or a subdivision order applies to the land.)

19 SITE VERIFICATION CERTIFICATES

(Information is provided in this section only if there is a current site verification certificate, of which council is aware, in respect of the land.)

NOTE: The following matters are prescribed by section 59(2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate

(a) (Information is provided in this section only if, as at the date of this certificate, the land (or part of the land) is significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.)

(b) (Information is provided in this section only if, as at the date of this certificate, the land is subject to a management order within the meaning of the Contaminated Land Management Act 1997.)

(c) (Information is provided in this section only if, as at the date of this certificate, the land is the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.)

(d) (Information is provided in this section only if, at the date of this certificate, the land subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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(e) (Information is provided in this section only if the land is the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997 – a copy of which has been provided to Council.)

Note: Section 149(5) information for this property may contain additional information regarding contamination issues.

Note: The Environmental Planning and Assessment Amendment Act 1997 commenced operation on the 1 July 1998. As a consequence of this Act the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment (Amendment) Regulation 1998, Environmental Planning and Assessment (Further Amendment) Regulation 1998 and Environmental Planning and Assessment (Savings and Transitional) Regulation 1998 and Environmental Planning and Assessment Regulation 2000.

Information is provided only to the extent that Council has been notified by relevant government departments.

149(5) Certificate
This Certificate is directed to the following relevant matters affecting the land

When information pursuant to section 149(5) is requested the Council is under no obligation to furnish any of the information supplied herein pursuant to that section. Council draws your attention to section 149(6) which states that a council shall not incur any liability in respect of any advice provided in good faith pursuant to sub-section (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate.

Note:

- Council's 149(5) information does not include development consent or easement information. Details of development consents may be obtained by making enquiries with Council's Development Services Department pursuant to section 12 of the Local Government Act 1993 or (for development applications lodged after January 2007) by viewing the Online Services area at www.penrithcity.nsw.gov.au . Details of any easements may be obtained from a Title Search at Land and Property Information New South Wales.
- This certificate does not contain information relating to Complying Development Certificates.
- This certificate may not provide full details of development rights over the land.

* Threatened Species Conservation Act 1995

When considering any development application Council must have regard to the Threatened Species Conservation Act 1995. Please note that this legislation may have application to any land throughout the city. Interested persons should make their own enquiries in regard to the impact that this legislation could have on this land.

* Preservation of Trees and Vegetation

See Clauses 5.9 and 5.9AA of Penrith Local Environmental Plan 2010 and Chapter C2 of Penrith Development Control Plan 2014 for specific controls relating to the preservation of trees and vegetation.

* Development Control Plan General Information

Penrith Development Control Plan 2014 which applies to the land, sets out requirements for a range of issues that apply across the Penrith Local Government Area, including:

- Site Planning and Design Principles

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Vegetation Management
- Water Management
- Land Management
- Waste Management
- Landscape Design
- Culture and Heritage
- Public Domain
- Advertising and Signage
- Transport, Access and Parking
- Subdivision
- Noise and Vibration, and
- Infrastructure and Services.

The Development Control Plan also specifies requirements relating to various types of land uses including:

- Rural Land Uses
- Residential Development
- Commercial and Retail Development, and
- Industrial Development

as well as for a number of specific activities, including child care centres; health consulting rooms; educational establishments; parent friendly amenities; places of public worship; vehicle repair stations; cemeteries, crematoria and funeral homes; extractive industries; and telecommunication facilities.
The Development Control Plan also details requirements relating to key precincts within the Penrith Local Government Area, including:

- Caddens
- Claremont Meadows Stage 2
- Cranebrook
- Emu Heights
- Emu Plains
- Erskine Business Park
- Glenmore Park
- Kingswood
- Mulgoa Valley
- Orchard Hills
- Penrith
- Penrith Health and Education Precinct
- Riverlink Precinct
- St Clair, and
- St Marys / St Marys North.

Penrith Development Control Plan 2014 may be accessed at https://www.penrithcity.nsw.gov.au/Building-and-Development/Planning-and-Zoning/Planning-Controls/Development-Control-Plans/

* Penrith City Centre Controls

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

See Part 8 of Penrith Local Environmental Plan 2010 and Chapter E11 of Penrith Development Control Plan 2014 for specific controls relating to Penrith City Centre (which includes the subject property).

* Active Street Frontage

The land is identified as an "Active Street Frontage" on the Penrith Local Environmental Plan 2010 (PLEP 2010) Active Street Frontages Map. See Clause 7.8 of PLEP 2010 for details.

Alan Stoneham
General Manager

PER

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

ATTACHMENT C

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Department of Primary Industries
Office of Water

Home | About us | Water Management | Water Licensing | Urban Water | Real-time data

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All Groundwater
find a site
All Groundwater Map

bandwidth high low
glossary and metadata

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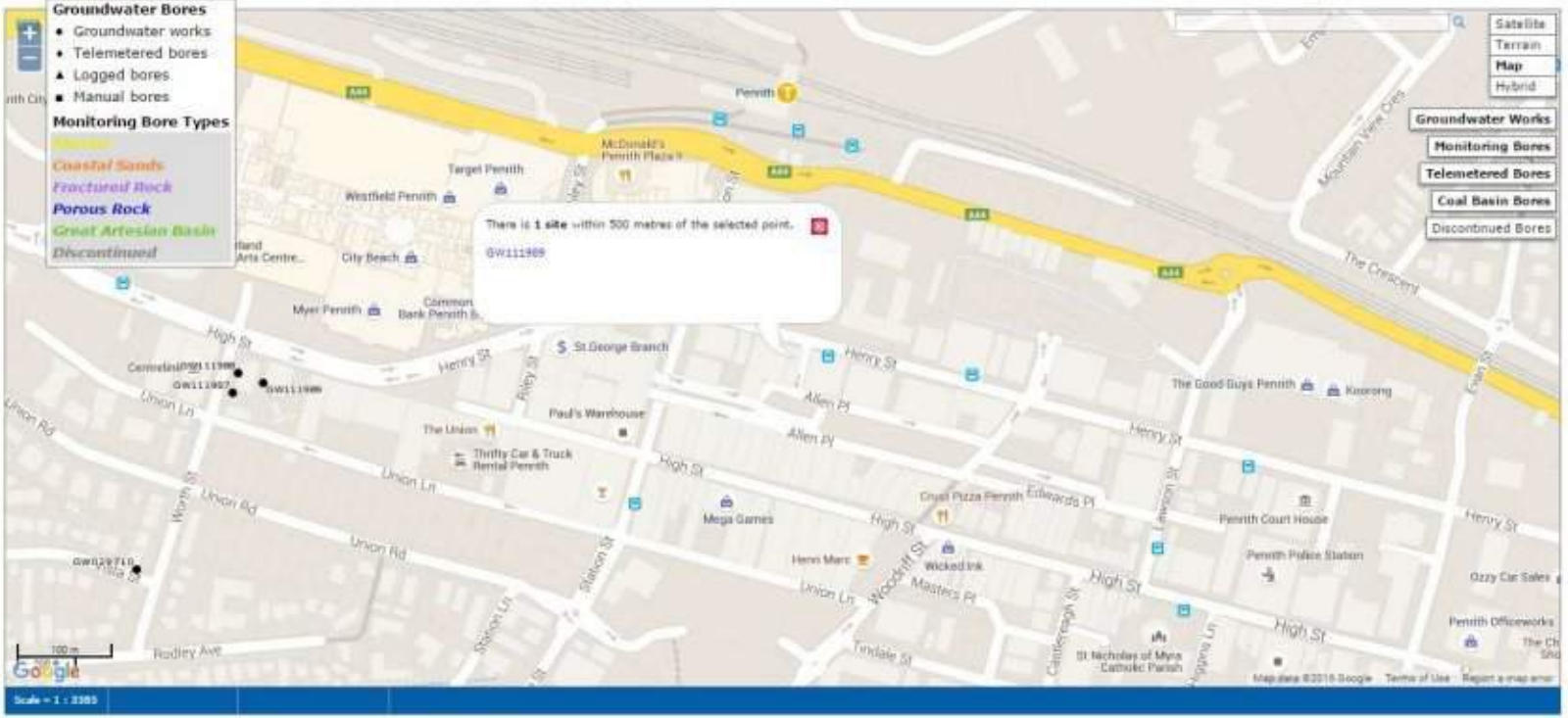
All data times are Eastern Standard Time

Map | Info

Groundwater Bores
- Groundwater works
- Telemetered bores
- Logged bores
- Manual bores

Monitoring Bore Types
- Alluvial
- Coastal Sands
- Fractured Rock
- Porous Rock
- Great Artesian Basin
- Discontinued



Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

NSW Office of Water
Work Summary

GW111989

Licence: 10BL603225 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Well
Work Status: Equipped
Construct.Method: Auger - Solid Flight
Owner Type: Private

Commenced Date: **Final Depth:** 9.00 m
Completion Date: 24/03/2010 **Drilled Depth:** 9.00 m

Contractor Name: Numac Drilling Services
Driller: Christopher Mcmullen
Assistant Driller:

Property: WOOLWORTHS PETROL DIVISION
CORNER WORTH AND HIGH STREET
PENRITH 2750 NSW
Standing Water Level:
GWMA: **Salinity:**
GW Zone: **Yield:**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	3//541045
Licensed:			

Region: 10 - Sydney South Coast **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6262897.0 **Latitude:** 33°45'08.8"S
Elevation Source: Unknown **Easting:** 286157.0 **Longitude:** 150°41'28.7"E

GS Map: - **MGA Zone:** 0 **Coordinate Source:** Unknown

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	125			Auger - Solid Flight
1		Annulus	Waterworn/Rounded	0.00	0.00				Graded
1	1	Casing	Pvc Class 18	0.00	6.00	60	50		Seated on Bottom, Other
1	1	Opening	Slots - Horizontal	6.00	9.00	60		1	Casing - Machine Slotted, PVC Class 18, Other, SL: 40.0mm, A: 3.80mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
7.50	9.00	1.50	Unknown						

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.00	3.00	CLAY MINOR SAND RED BROWN	Clay	
3.00	9.00	6.00	GRAVEL WITH MINOR SAND	Gravel	

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status & fixed drillers log errors.

***** End of GW111989 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

ATTACHMENT D

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Job No 10864415

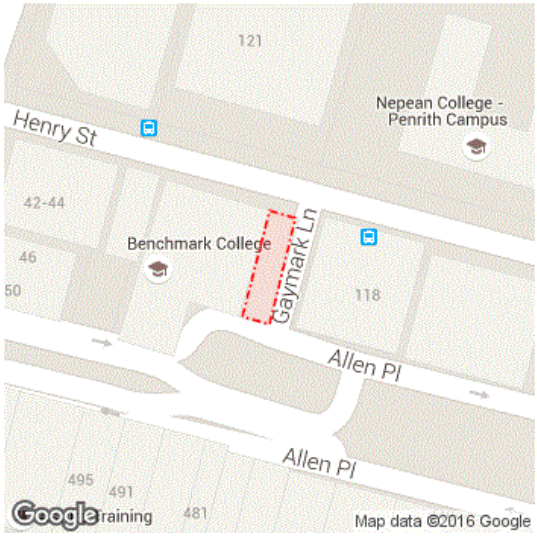
Phone: 1100
www.1100.com.au

Caller Details

Contact:	Mr Tim Gunns	**Caller Id:**	1486843	**Phone:**	0411724429
Company:	Geo-Logix	**Mobile:**	0411724429	**Fax:**	Not Supplied
Address:	Building Q2, Level 3 Unit 2309 Daydream Stre Warriewood NSW 2102	**Email:**	tgunns@geo-logix.com.au		

Dig Site and Enquiry Details

WARNING: The map below only displays the location of the proposed dig site and does not display any asset owners' pipe or cables. The area highlighted has been used only to identify the participating asset owners, who will send information to you directly.



User Reference: Henry Street
Working on Behalf of:
Penrith City Council

Enquiry Date:	**Start Date:**	**End Date:**
22/06/2016	30/06/2016	01/07/2016

Address:
134-138 Henry Street
Penrith NSW 2750

Job Purpose: Excavation
Onsite Activity: Vertical Boring
Location of Workplace: Private Property
Location in Road: Not Supplied

- Check that the location of the dig site is correct. If not you must submit a new enquiry.
- Should the scope of works change, or plan validity dates expire, you must submit a new enquiry.
- Do NOT dig without plans. Safe excavation is your responsibility. If you do not understand the plans or how to proceed safely, please contact the relevant asset owners.

Notes/Description of Works:
Shallow boring <1m

Your Responsibilities and Duty of Care

- If plans are not received within 2 working days, contact the asset owners directly & quote their Sequence No.
- ALWAYS perform an onsite inspection for the presence of assets. Should you require an onsite location, contact the asset owners directly. Please remember, plans do not detail the exact location of assets.
- Pothole to establish the exact location of all underground assets using a hand shovel, before using heavy machinery.
- Ensure you adhere to any State legislative requirements regarding Duty of Care and safe digging requirements.
- If you damage an underground asset you MUST advise the asset owner immediately.
- By using this service, you agree to Privacy Policy and the terms and disclaimers set out at **www.1100.com.au**
- **For more information on safe excavation practices, visit www.1100.com.au**

Asset Owner Details

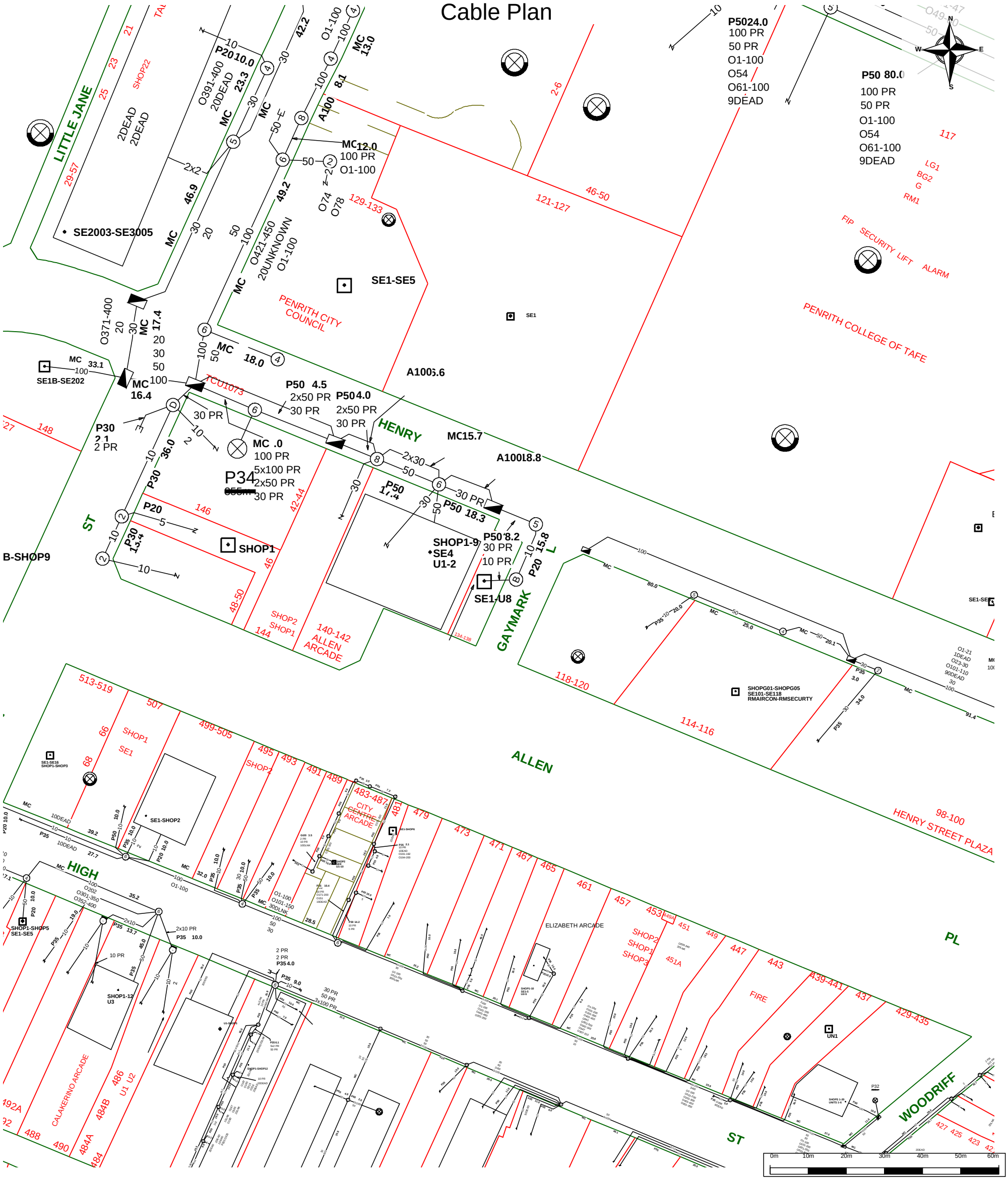
The assets owners listed below have been requested to contact you with information about their asset locations within 2 working days. Additional time should be allowed for information issued by post. It is **your responsibility** to identify the presence of any underground assets in and around your proposed dig site. Please be aware, that not all asset owners are registered with the Dial Before You Dig service, so it is **your responsibility** to identify and contact any asset owners not listed here directly.
** Asset owners highlighted by asterisks ** require that you visit their offices to collect plans.
# Asset owners highlighted with a hash require that you call them to discuss your enquiry or to obtain plans.

Seq. No.	Authority Name	Phone	Status
53745463	Endeavour Energy	0298534161	NOTIFIED
53745466	Jemena Gas West	1300880906	NOTIFIED
53745469	NBN Co, NswAct	1800626762	NOTIFIED
53745465	Optus and/or Uecomm, Nsw	1800505777	NOTIFIED
53745462	PIPE Networks, Nsw	1800201100	NOTIFIED
53745468	Soul Australia Communication	0249273525	NOTIFIED
53745467	Sydney Water	132092	NOTIFIED
53745464	Telstra NSW, Central	1800653935	NOTIFIED

END OF UTILITIES LIST

Lodge Your Free Enquiry Online – 24 Hours a Day, Seven Days a Week

Cable Plan



For all Telstra DBYD plan enquiries -
email - Telstra.Plans@team.telstra.com
For urgent onsite contact only - ph 1800 653 935 (bus hrs)

TELSTRA CORPORATION LIMITED A.C.N. 051 775 556

Generated On 22/06/2016 16:41:39

Sequence Number: 53745464

CAUTION: Critical Network Route in plot area.
DO NOT PROCEED with any excavation prior to seeking advice from Telstra Plan Services on : 1800 653 935

The above plan must be viewed in conjunction with the Mains Cable Plan on the following page

WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

It is your responsibility to locate Telstra's underground plant by careful hand pot-holing prior to any excavation in the vicinity and to exercise due care during that excavation.

Please read and understand the information supplied in the duty of care statement attached with the Telstra plans. TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT.

Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.

PENRITH 6B

SCALE 1:2000

50 0 50 100 150 200

THIS MAP UPDATED ON 31/03/2016
THIS PLAN IS DIAGRAMATIC ONLY. DISTANCES SCALED FROM THIS PLAN MAY NOT BE ACCURATE.

PE3C	PE3D	SMIC
PE6A	PE6B	SM4A
PE6C	PE6D	SM4C

ADJOINING MAPS

815 / 813	PENRITH
NETWORK AREA	MUNICIPALITY AREA

Jemena

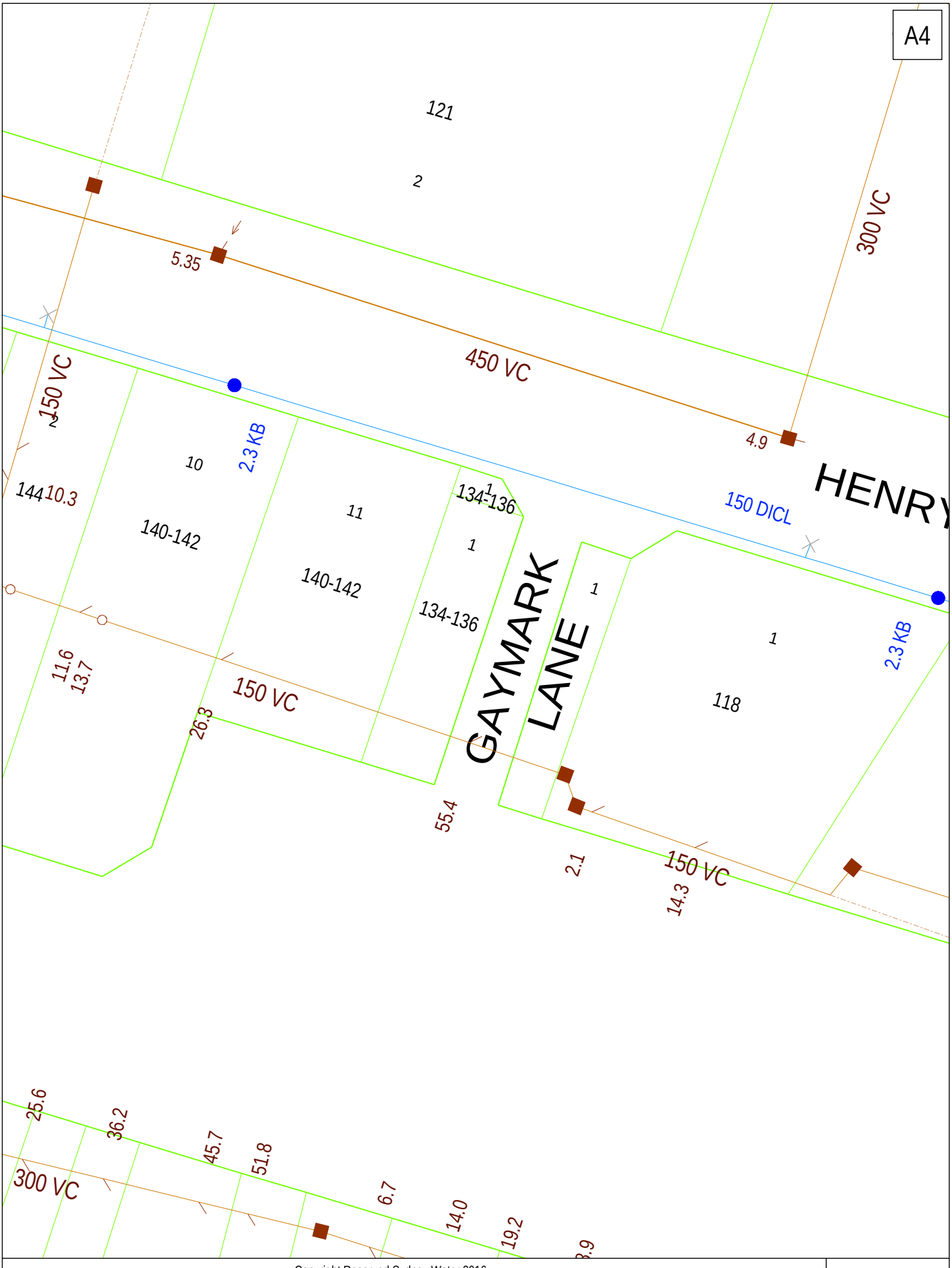
KEY

MAX ALLOWABLE OPERATING PRESSURE

T	TRUNK PIPELINE	7000 kPa
P	PRIMARY MAIN	3500 kPa
S	SECONDARY MAIN	1050 kPa
400	NETWORK MAIN	400 kPa
	NETWORK MAIN	300 kPa
	NETWORK MAIN	210 kPa
100	NETWORK MAIN	100 kPa
30	NETWORK MAIN	30 kPa
	NETWORK MAIN	7 kPa
	NETWORK MAIN	2 kPa
	PROPOSED MAINS	
PR II-2 3	STEEL MAIN PROJECT NUMBER	
P	PRESSURE MONITORING STATION	
	VALVE	
	SYSTEM PRESSURE REGULATOR	
S	SIPHON	
123	NETWORK NODE	
123S	NETWORK VALVE NODE	
1298	VALVE NUMBER	
6NB	6 INCH CAST IRON MAIN	
150MM	150MM STEEL MAIN	
110MM PE/NY	110MM POLYETHYLENE/NYLON MAIN	
6NB 50MM NY	50MM NYLON INSERTED INTO 6NB MAIN CAST IRON MAIN	
1.2MBL	DISTANCE IN METRES OF MAIN FROM BOUNDARY LINE	
1957	YEAR LAID	
	MUNICIPALITY BOUNDARY	
	NETWORK BOUNDARY	
123	HOUSE NUMBER	

PENRITH 6B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



DBYD Address:
n/a Henry Street
Penrith NSW 2750

DBYD Job No: 10864415
DBYD Sequence No: 53745467

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No warranty is given that the information shown is complete or accurate.

SYDNEY WATER CORPORATION

Scale: 1:500

Date of Production: 22/06/2016

Plan 1 of 1

N

0m 2m 4m 6m 8m 10m

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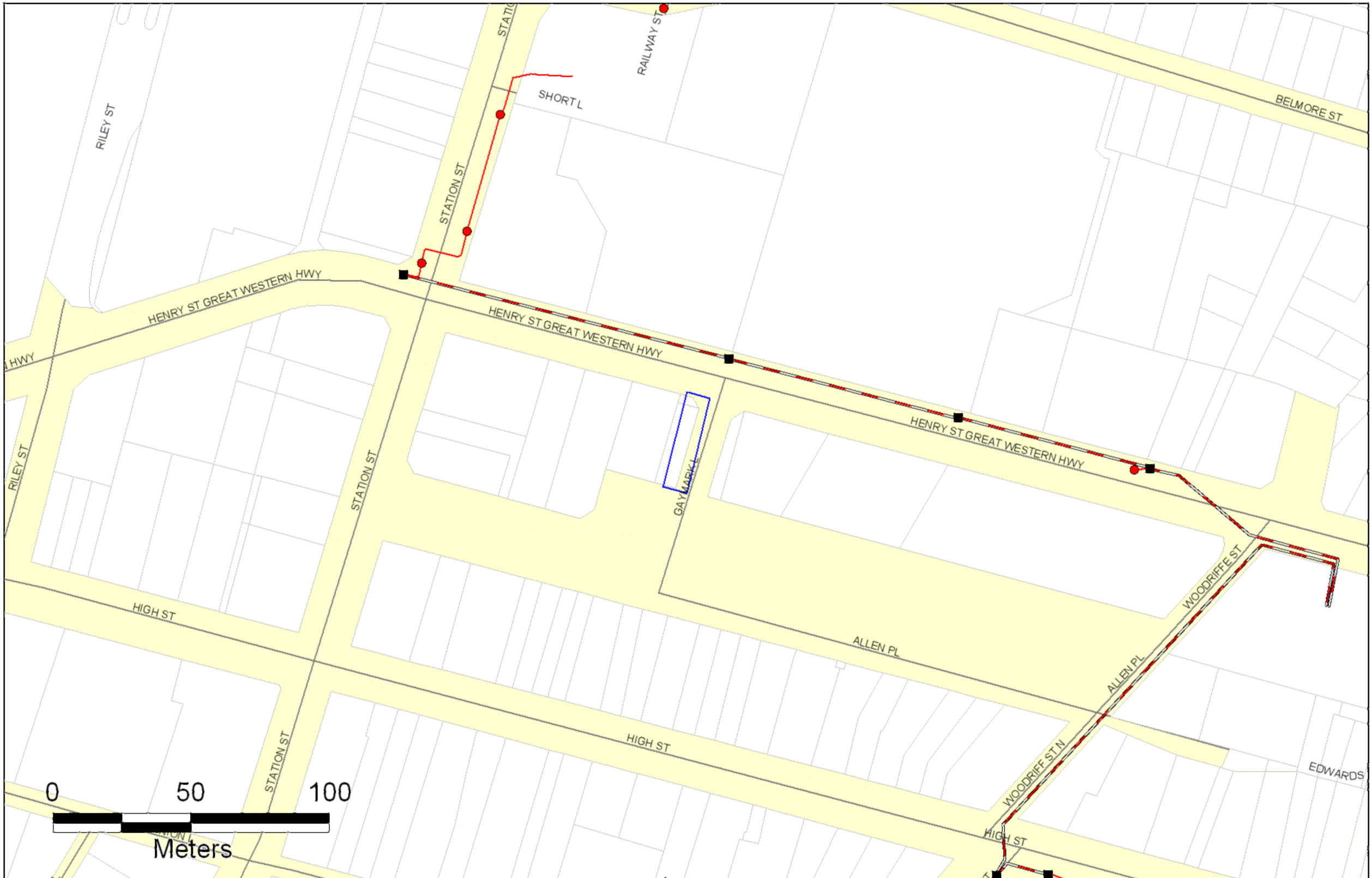

SEQUENCE NUMBER	53745488	Map Number	1 of 1	DATE	23/08/2018	Map Reference	DBYD Fibre	Comment	

WARNING - MAJOR OPTIC FIBRE IN THE AREA.

The accuracy completeness of the information provided can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. OPGW AUSTRALIA CONNECTION does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans. It is your responsibility to locate OPGW AUSTRALIA CONNECTION underground plant by careful hand pot-holing prior to any excavation in the vicinity and to exercise due care during that excavation. OPGW AUSTRALIA CONNECTION WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT. Please read and understand the information provided in the duty of care statement attached with the OPGW AUSTRALIA CONNECTION Plans. OPGW AUSTRALIA CONNECTION plans or other details are provided for the use of the applicant, its servants, or agents, and shall not be used for any unauthorised purpose. Contact the OPGW AUSTRALIA CONNECTION OPGW AUSTRALIA CONNECTION plans and information are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans. OPGW AUSTRALIA CONNECTION retains copyright of these plans and as such they should be disposed of by shredding or any other secure disposal method after use.

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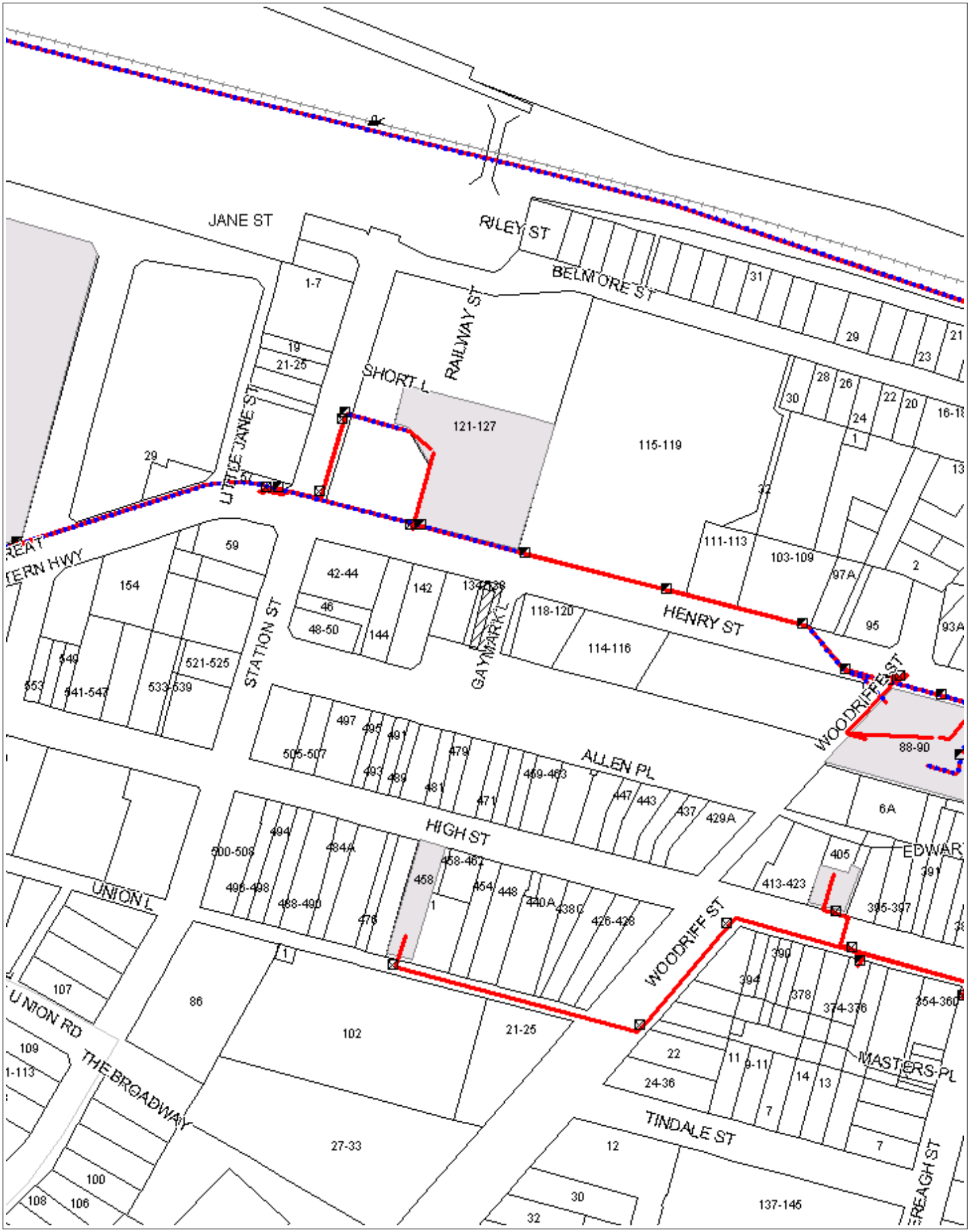

WARNING: This document is confidential and may also be privileged. Confidentiality nor privilege is not waived or destroyed by virtue of it being transmitted to an incorrect addressee. Unauthorised use of the contents is therefore strictly prohibited. Any information contained in this document that has been extracted from our records is believed to be accurate, but no responsibility is assumed for any error or omission.
Optus Plans and information supplied are valid for 30 days from the date of issue. If this timeline has elapsed please raise a new enquiry.

Sequence Number: 53745465

Date Generated: 22/06/2016

For all Optus DBYD plan enquiries –
Email: Fibre.Locations@optus.net.au
For urgent onsite assistance contact 1800 505 777
Optus Limited ACN 052 833 208

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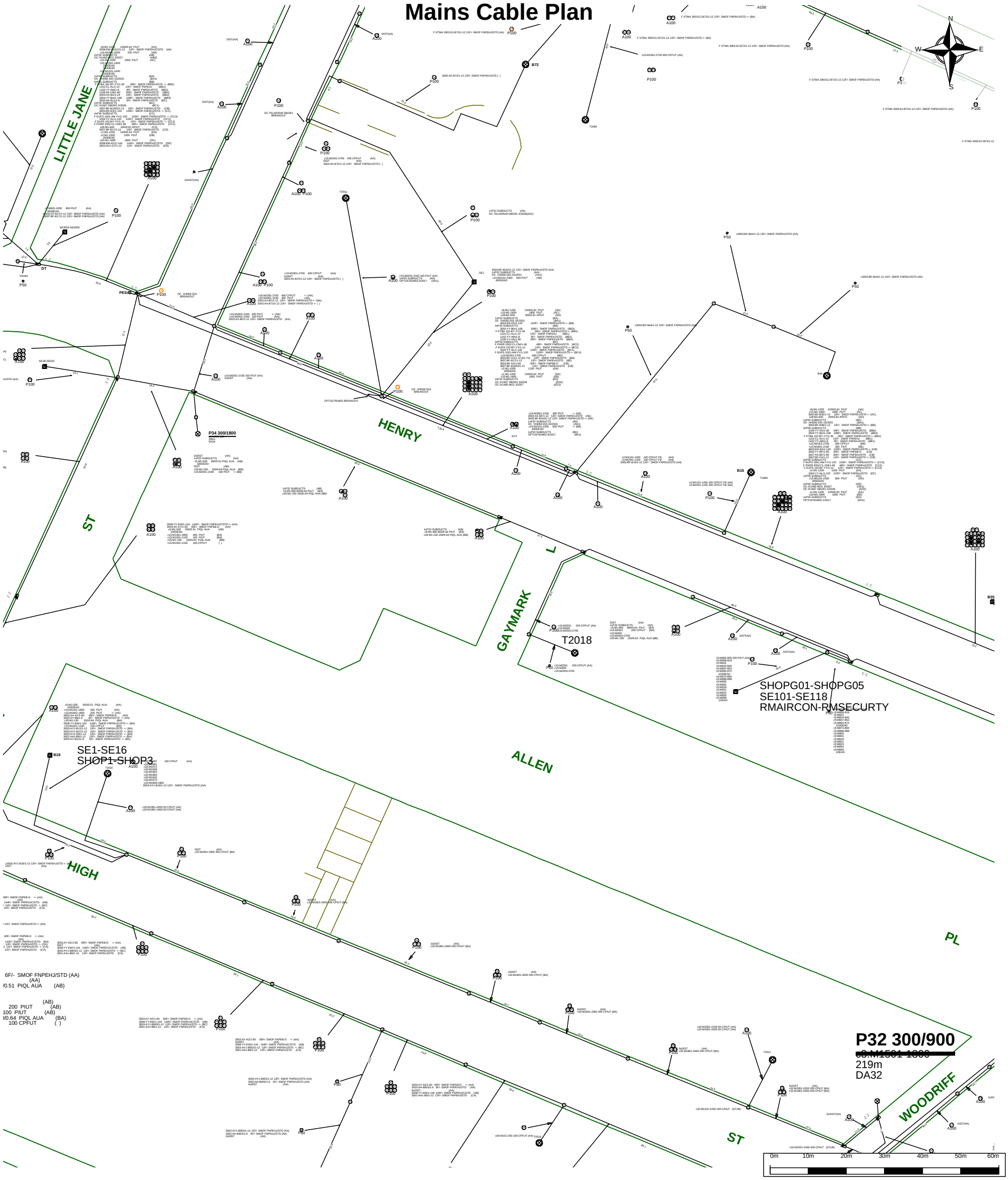
Mains Cable Plan



For all Telstra DBYD plan enquiries -
email - Telstra.Plans@team.telstra.com
For urgent onsite contact only - ph 1800 653 935 (bus hrs)

TELSTRA CORPORATION LIMITED A.C.N. 051 775 556

Generated On 22/06/2016 16:41:58

Sequence Number: 53745464

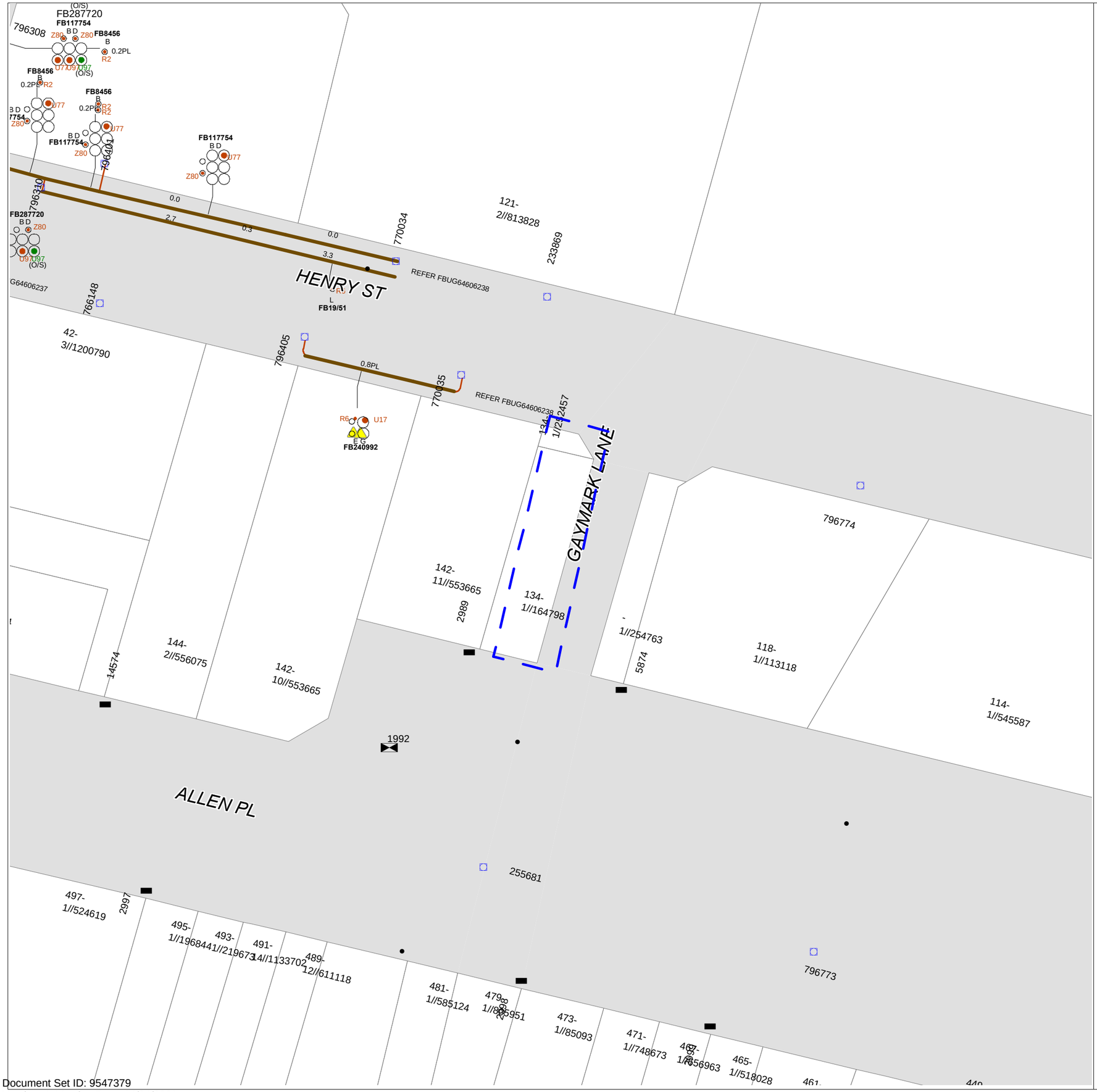
CAUTION: Critical Network Route in plot area.
DO NOT PROCEED with any excavation prior to seeking advice from Telstra Plan Services on :
1800 653 935

WARNING - Due to the nature of Telstra underground plant and the age of some cables and records, it is impossible to ascertain the precise location of all Telstra plant from Telstra's plans. The accuracy and/or completeness of the information supplied can not be guaranteed as property boundaries, depths and other natural landscape features may change over time, and accordingly the plans are indicative only. Telstra does not warrant or hold out that its plans are accurate and accepts no responsibility for any inaccuracy shown on the plans.

It is your responsibility to locate Telstra's underground plant by careful hand pot-holing prior to any excavation in the vicinity and to exercise due care during that excavation.

Please read and understand the information supplied in the duty of care statement attached with the Telstra plans. TELSTRA WILL SEEK COMPENSATION FOR LOSS CAUSED BY DAMAGE TO ITS PLANT.

Telstra plans and information supplied are valid for 60 days from the date of issue. If this timeframe has elapsed, please reapply for plans.



Endeavour Energy

WARNING

- **All electrical apparatus shall be regarded as live until proved de-energised.** Contact with live electrical apparatus will cause severe injury or death.
- In accordance with the *Electricity Supply Act 1995*, you are obliged to report any damage to Endeavour Energy Assets immediately by calling **131 003**.
- The customer must obtain a new set of plans from Endeavour Energy if work has not been started or completed within twenty **(20)** working days of the original plan issue date.
- The customer must contact Endeavour Energy if any of the plans provided have blank pages, as some underground asset information may be incomplete.
- Endeavour Energy underground earth grids may exist and their location **may not** be shown on plans. Persons excavating are expected to exercise all due care, especially in the vicinity of padmount substations, pole mounted substations, pole mounted switches, transmission poles and towers.
- Endeavour Energy plans **do not** show any underground customer service mains or information relating to service mains within private property.
- Asbestos or asbestos-containing material may be present on or near Endeavour Energy's underground assets.
- Organo-Chloride Pesticides (OCP) may be present in some sub-transmission trenches.
- All plans must be printed and made available at the worksite where excavation is to be undertaken. Plans must be reviewed and understood by the crew on site prior to commencing excavation.

INFORMATION PROVIDED BY ENDEAVOUR ENERGY

- Any plans provided pursuant to this service are intended to show the approximate location of underground assets relative to road boundaries, property fences and other structures at the time of installation.
- Depth of underground assets may vary significantly from information provided on plans as a result of changes to road, footpath or surface levels subsequent to installation.
- Such plans have been prepared solely for use by Endeavour Energy staff for design, construction and maintenance purposes.
- All enquiry details and results are kept in a register.

DISCLAIMER

Whilst Endeavour Energy has taken all reasonable steps to ensure that the information contained in the plans is as accurate as possible it will accept no liability for inaccuracies in the information shown on such plans.

WARNING
THIS EXCAVATION IS IN THE VICINITY OF ENDEAVOUR ENERGY TRANSMISSION, PILOT, COMMUNICATION OR FIBRE OPTIC CABLES
PLEASE RING **9853 7121** or **MOB. 0407 468 626**
4 WORKING DAYS BEFORE COMMENCING WORK

LEGEND

- Street light column
- Padmount substation
- Overground pillar (O.G.Box)
- Underground pit
- Duct run
- Cable run
- Typical duct section
- Asbestos warning

N

NOT TO SCALE

DBYD Sequence No.:	53745463
Issued Date:	22/06/2016

Cadastre: © Land and Property Information 2015, 2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Referral Conditions

The following are conditions on which **nbn** provides you with the Indicative Plans. By receiving, accepting or relying upon the plans (including the Indicative Plans), you are agreeing to these conditions. These conditions are in addition to (and not in replacement of) any duties and obligations you have under applicable law.

1. **nbn** does not accept any responsibility for any inaccuracies of its plans including the Indicative Plans. You are expected to make your own inquiries and perform your own investigations (including engaging appropriately qualified plant locators at your cost to locate **nbn** telecommunications facilities during any activities you carry out on site).
2. You should not assume that **nbn** cables and assets follow straight lines or are installed at uniformed depths along their lengths, even if they are indicated on plans provided to you. Careful onsite investigations are essential to locate the exact position of cables.
3. In carrying out any works in the vicinity of **nbn** facilities, you must maintain the following minimum clearances:
    - 300mm when laying assets inline, horizontally or vertically
    - 500mm when operating vibrating equipment, for example: jackhammers or vibrating plates;and
    - 1000mm when operating mechanical excavators.
    - Adherence to clearances as directed by other asset owner's instructions
4. You are aware that there are inherent risks and dangers associated with carrying out work in the vicinity of underground facilities (such as **nbn** fibre optic,copper and coaxial cables, to **nbn** assets).Damage to underground electric cables may result in:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Injury from electric shock or severe burns, with the possibility of death.
- Interruption of the electricity supply to wide areas of the city.
- Damage to your excavating plant.
- Responsibility for the cost of repairs.

5. You must take all reasonable precautions to avoid damaging **nbn** facilities. These precautions may include ,but not limited to, the following:
    - All excavation sites should be examined for underground cables by careful hand excavation. Cable cover slabs if present must not be disturbed. Hand excavation needs to be undertaken with extreme care to minimise the likelihood of damage to the cable, for example, the blades of hand equipment should be aligned parallel to the line of the cable rather than digging across the cable.
    - If any undisclosed underground cables are located, notify **nbn** immediately.
    - All personnel must be properly briefed, particularly those associated with the use of earth-moving equipment, trenching, boring and pneumatic equipment.
    - The safety of the public and other workers must be ensured.
    - All excavations must be undertaken in accordance with all relevant legislation and regulations.
6. You will be responsible for all damage to **nbn** facilities that are connected whether directly, or indirectly with work you carry out (or work that is carried out for you or on your behalf) at the Location. This will include,without limitation, all losses expenses incurred by **nbn** as a result of any such damage.
7. You must immediately report any damage to **nbn™** network that you are/become aware of. Notification may be by telephone - 1800 626 762.
8. Except to the extent that liability may not be capable of lawful exclusion, **nbn** and its servants and agents and the related bodies corporate of **nbn** and their servants and agents shall be under no liability whatsoever to any person for any loss or damage (including indirect or consequential loss or damage) however caused (including, without limitation, breach of contract negligence and/or breach of statute) which may be suffered or incurred from or in connection with this information sheet or any Plans attached hereto. Except as expressly provided to the contrary in this information sheet or the attached Indicative Plans, all terms, conditions, warranties, undertakings or representations (whether expressed or implied) are excluded to the fullest extent permitted by law.

All works undertaken shall be in accordance with all relevant legislations, acts and regulations applicable to the particular state or territory of the Location. The following table lists all relevant documents that shall be considered and adhered to.

State/Territory	Documents
National	Work Health and Safety Act 2011
	Work Health and Safety Regulations 2011
	Safe Work Australia - Working in the Vicinity of Overhead and Underground Electric Lines (Draft)
	Occupational Health and Safety Act 1991
NSW	Electricity Supply Act 1995

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

	Work Cover NSW - Work Near Underground Assets Guide
	Work Cover NSW - Excavation Work: Code of Practice
VIC	Electricity Safety Act 1998
	Electricity Safety (Network Asset) Regulations 1999
QLD	Electrical Safety Act 2002
	Code of Practice for Working Near Exposed Live Parts
SA	Electricity Act 1996
TAS	Tasmanian Electricity Supply Industry Act 1995
WA	Electricity Act 1945
	Electricity Regulations 1947
NT	Electricity Reform Act 2005
	Electricity Reform (Safety and Technical) Regulations 2005
ACT	Electricity Act 1971

Thank You,

Network Operations Centre - Assurance

Date: 06/22/2016

This document is provided for information purposes only. This document is subject to the information classification set out on this page. If no information classification has been included, this document must be treated as UNCLASSIFIED, SENSITIVE and must not be disclosed other than with the consent of nbn co. The recipient (including third parties) must make and rely on their own inquiries as to the currency, accuracy and completeness of the information contained herein and must not use this document other than with the consent of nbn co.

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Version: 1, Version Date: 14/04/2021

ATTACHMENT E

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

ADVANCE LEGAL SEARCHERS PTY LIMITED

(ACN 147 943 842)
ABN 82 147 943 842

P.O. Box 149
Yagoona NSW 2199

Telephone: +612 9644 1679
Mobile: 0412 169 809
Facsimile: +612 8076 3026
Email: alsearch@optusnet.com.au

11th June, 2016

GEO-LOGIX PTY LTD
Building Q2, Level 3,
Unit 2309/4 Daydream Street,
WARRIEWOOD NSW 2102

Attention: Tim Gunns,

RE: **134 – 138 Henry Street,**
Penrith
PO No: 1299

Note 1:	**Lot 1**	**DP 164798**	**(page 1)**
Note 2:	**Lot 1**	**DP 252457**	**(page 4)**

Note 1:

Current Search

Folio Identifier 1/164798 (title attached)
DP 164798 (plan attached)
Dated 8th June, 2016
Registered Proprietor:
PENRITH CITY COUNCIL

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Title Tree
Lot 1 DP 164798

Folio Identifier 1/164798

Certificate of Title Volume 13043 Folio 2

Qualified Certificate of Title Book 3226 No. 887

IVA 17975

Conveyance Book 2990 No. 295

Conveyance Book 2033 No. 174

Conveyance Book 2032 No. 575

Conveyance Book 423 No. 919

****

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Summary of Proprietors
Lot 1 DP 164798

Year	Proprietor
	(Lot 1 DP 164798)
2001 – todate	Penrith City Council
(2001 – todate)	*(current leases shown on Folio Identifier 1/164798)*
1991 – 2001	Nevat Pty. Limited.
(1993 – 2015)	*(various leases shown on Historical Folio 1/164798)*
	(Lot 1 DP 164798 – CTVol 13043 Fol 2)
1980 – 1991	Nevat Pty. Limited.
1978 – 1980	Daredon Pty. Limited
1976 – 1978	Geoffrey Howard Upton, retired garage proprietor
(1986 – 1991)	*(various leases shown on CTVol 13043 Fol 2)*
	(Lot 1 DP 164798 – Area 10 Perches – Qualified Certificate of Title Book 3226 No. 887)
1976 – 1976	Geoffrey Howard Upton *(Geoffrey Howard Upton and Geoffrey Howard Upton as mortgagee to Zenda Merle Upton and Mark Howard Upton)*
	(Lot 1 DP 164798 – Area 10 Perches – Conveyance Book 2990 No. 295)
1970 – 1976	Geoffrey Howard Upton, retired garage proprietor Zenda Merle Upton, wife Mark Howard Upton, property manager
	(That piece or parcel of land, Parish of Castlereagh – Area 38 ¼ Perches – Conv Bk 2033 No 174)
1947 – 1970	Geoffrey Howard Upton, boot repairer
	(That piece or parcel of land, Parish of Castlereagh – Area 38 ¼ Perches – Conv Bk 2032 No 575)
1947 – 1947	Charles William Owen Roberts, electrician
	(That piece or parcel of land, Parish of Castlereagh, part of the Woodriff Estate – Conv Bk 423 No 919)
1889 - 1947	Francis Henry Woodriff, gentleman

****

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Note 2:

Current Search

Folio Identifier 1/252457 (title attached)
DP 252457 (plan attached)
Dated 8th June, 2016
Registered Proprietor:
PENRITH CITY COUNCIL

Title Tree
Lot 1 DP 252457

Folio Identifier 1/252457

Certificate of Title Volume 15457 folio 157

Certificate of Title Volume 13169 folio 107

Crown Land

****

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Summary of Proprietors
Lot 1 DP 252457

Year	Proprietor
	(Lot 1 DP 252457)
2001 – todate	Penrith City Council
(2012 – todate)	*(current lease to David Wainwright Ellis and Andrew David Ellis)*
1987 – 2001	Nevat Pty. Limited.
(1987 – todate)	*(leases shown on Historical Folio 1/252457)*
	(Lot 1 DP 252457 – CTVol 15457 Fol 157)
1986 – 1987	Nevat Pty. Limited.
(1986 – 1987)	*(various leases shown on CTVol 15457 Fol 157)*
	(Lot 1 DP 252457 – CTVol 13169 Fol 107)
1980 – 1986	Nevat Pty. Limited.
1978 – 1980	Daredon Pty. Limited
1976 – 1978	Geoffrey Howard Upton Zenda Merle Upton Mark Upton *(Crown Grant No. 1976/2574, part of land resumed for Road widening)*
(1976 – 1986)	*(various leases shown on CTVol 13169 Fol 107)*
Prior – 1976	Crown Land

****

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Advance Legal Searchers Pty Ltd Phone: 02 9644 1679

Advance Legal Searchers Pty Ltd hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act.

Information provided through Tri-Search an approved LPI*NSW* Information Broker

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/252457

SEARCH DATE	TIME	EDITION NO	DATE
8/6/2016	2:51 PM	21	9/7/2012

LAND

LOT 1 IN DEPOSITED PLAN 252457
AT PENRITH
LOCAL GOVERNMENT AREA PENRITH
PARISH OF CASTLEREAGH COUNTY OF CUMBERLAND
TITLE DIAGRAM DP252457

FIRST SCHEDULE

PENRITH CITY COUNCIL (T 7705296)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
2 EXCEPTING LAND BELOW A DEPTH FROM THE SURFACE OF 20 METRES BY THE CROWN GRANT
3 AH98855 LEASE TO AUSTINLY INDUSTRIAL PTY LIMITED BEING SHOP 3, 134-138 HENRY STREET, PENRITH. EXPIRES: 31/5/2017. OPTION OF RENEWAL: FIVE YEARS.
* AH762810 TRANSFER OF LEASE AH98855 LESSEE NOW DAVID WAINWRIGHT ELLIS & ANDREW DAVID ELLIS

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

geo logix - penri PRINTED ON 8/6/2016

****ANY ENTRIES PRECEDED BY AN ASTERISK DO NOT APPEAR ON THE CURRENT EDITION OF THE CERTIFICATE OF TITLE. WARNING: THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER.***

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/164798

SEARCH DATE	TIME	EDITION NO	DATE
8/6/2016	2:49 PM	22	4/9/2015

LAND

LOT 1 IN DEPOSITED PLAN 164798
AT PENRITH
LOCAL GOVERNMENT AREA PENRITH
PARISH OF CASTLEREAGH COUNTY OF CUMBERLAND
TITLE DIAGRAM DP164798

FIRST SCHEDULE

PENRITH CITY COUNCIL (T 7705296)

SECOND SCHEDULE (5 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 AG865521 LEASE TO CHRIS KAPSIS BEING SUITE 2, 134-138 HENRY STREET, PENRITH. EXPIRES: 31/10/2014.
3 AH98855 LEASE TO AUSTINLY INDUSTRIAL PTY LIMITED BEING SHOP 3, 134-138 HENRY STREET, PENRITH. EXPIRES: 31/5/2017. OPTION OF RENEWAL: FIVE YEARS.
4 AI331207 LEASE TO VERONICA RILLO OF SHOP 2, 134-138 HENRY STREET, PENRITH. EXPIRES: 31/10/2016.
5 AJ787749 LEASE TO AMANDA PERREAU & MATTHEW VELLA OF SHOP 1, 134-138 HENRY STREET, PENRITH. EXPIRES: 31/7/2018.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

ANY ENTRIES PRECEDED BY AN ASTERISK DO NOT APPEAR ON THE CURRENT EDITION OF THE CERTIFICATE OF TITLE. WARNING: THE INFORMATION APPEARING UNDER NOTATIONS HAS NOT BEEN FORMALLY RECORDED IN THE REGISTER.

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◄ RECENT ACTIVITY
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LPI On-Line

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
8/6/2016 2:54PM

FOLIO: 1/252457 PAGE 2

Recorded	Number	Type of Instrument	C.T. Issue
13/8/1997	3317467	LEASE	
13/8/1997	3317468	LEASE	EDITION 13
12/7/1999	5977180	REQUEST	
12/7/1999	5977181	LEASE	EDITION 14
28/11/2000	7250369	LEASE	EDITION 15
21/6/2001	7705295	DISCHARGE OF MORTGAGE	
21/6/2001	7705296	TRANSFER	EDITION 16
24/7/2002	8799669	LEASE	EDITION 17
21/10/2004	AB39285	LEASE	EDITION 18
22/2/2006	AC131903	LEASE	EDITION 19
17/8/2007	AD352769	LEASE	EDITION 20
9/7/2012	AH98855	LEASE	EDITION 21
28/5/2013	AH762810	TRANSFER OF LEASE	

*** END OF SEARCH ***

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Information provided through Tri-Search an approved LPI*NSW* Information Broker

◄ RECENT ACTIVITY
Powered by triSearch

Advance Legal Searchers Pty Ltd Phone: 02 9644 1679

LPI On-Line

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE

8/6/2016 2:52PM

FOLIO: 1/164798 PAGE 2

Recorded	Number	Type of Instrument	C.T. Issue
17/8/2007	AD352769	LEASE	EDITION 15
22/10/2009	AF57140	LEASE	EDITION 16
30/12/2009	AF221458	LEASE	EDITION 17
14/12/2011	AG686998	LEASE	EDITION 18
13/3/2012	AG865521	LEASE	EDITION 19
9/7/2012	AH98855	LEASE	EDITION 20
28/1/2014	AI331207	LEASE	EDITION 21
4/9/2015	AJ787749	LEASE	EDITION 22

*** END OF SEARCH ***

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

R.154

PARISH CASTLEREAGH
COUNTY CUMBERLAND
LAND DISTRICT PENRITH
CITY PENRITH
PLAN OF ROAD PURCHASE
APPLICATION BY
G.H., M.H. AND Z.M. UPTON.

D.P 252457

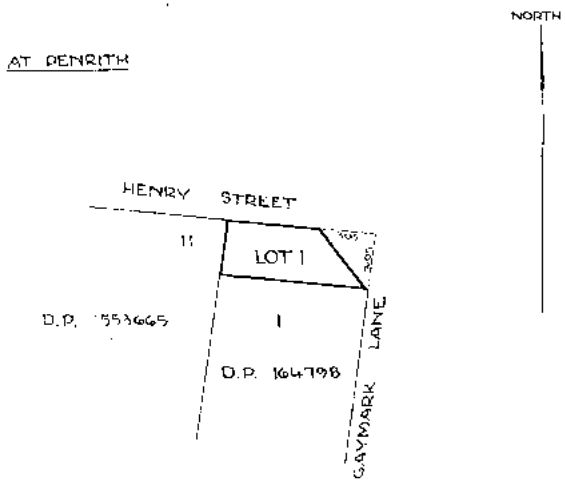
Registered 22-7-1976

Purpose Crown Grant Issue

Ref. Map Penrith Sh.1

NOTIFIED

AT PENRITH



AREA : 20·45 m²

PREPARED IN THE DEPARTMENT OF LANDS

Papers 205 76-173

I, Jack Hayward Watson, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 22nd day of July, 1976.

J. Watson

Req:R854595 /Doc:DP 0252457 P /Rev:24-Jun-1992 /Sts:OK.OK /Pgs:ALL /Prt:08-Jun-2016 14:49 /Seq:1 of 1
Refrals /Src:T

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

DP 164798

MPS (OS) HG22330

Plan Form No 6A(for transfers, leases, etc)

Municipality of Penrith

PLAN

of subdivision of Lots B and C MPS(OS)6851 and Lot E MPS(OS)7081

Parish of Castlereagh County of Cumberland

Scale : 50 feet to an inch.

1965

Appn 28774

HENRY ST

STATION ST

HIGH ST

LANE 20ft wide

ROAD WIDENING 10ft wide 6¾ per

Aligned 12° 42' 10"

Note - The Road Widening 10ft wide containing an area of 6¾per is hereby dedicated to the public.

Witness

The Mutual Life and Citizens' Assurance Company Limited hereby consents to the within Plan.

Approved by Council and sealed by Council Clerks Certificate

Council Clerk

Datum Line of Azimuths A and B

I, Peter Freeburn of 244 High St Penrith a surveyor registered under the Surveyors Act. 1929-1940, hereby certify that the survey represented in this plan is accurate and was made * [redacted] (2) under my immediate supervision in accordance with the Survey Practice Regulations, 1933, and was completed on * 9th November 1950

(Signature) Peter Freeburn

Surveyor registered under the Surveyors Act, 1929-49.

*Strike out either (1) or (2). Insert date of Survey.

CONVERSION TABLE ADDED IN DEPARTMENT OF LANDS

FEET	INCHES	METRES
-	1 1/8	0.029
-	5	0.127
-	6 3/8	0.162
-	8	0.203
1	2 1/4	0.362
1	5 1/8	0.435
1	6	0.457
1	6 1/8	0.460
1	9 3/4	0.552
1	9 7/8	0.556
2	3	0.686
10	-	3.046
10	0 1/8	3.051
10	5 1/4	3.181
11	8 7/8	3.578
11	9	3.581
11	9 1/4	3.588
12	-	3.658
15	0 1/2	4.585
19	9 1/4	6.026
19	11 7/8	6.093
20	-	6.096
20	3	6.172
26	-	7.925
27	-	8.230
28	-	8.534
40	3	12.268
42	-	12.802
49	4 3/4	15.056
50	9 1/4	15.475
58	6 3/8	17.840
60	-	18.288
63	1 3/8	19.237
63	1 7/8	19.250
66	-	20.117
77	-	23.470
77	0 1/8	23.473
97	5 1/4	29.699
99	3 1/4	30.258
99	11 1/4	30.461
100	11 5/8	30.775
101	-	30.785
105	3 5/8	32.096
105	7 1/8	32.185
116	6 1/8	35.512
131	4 1/2	40.043
151	7 1/8	46.044
165	-	50.292
165	1 5/8	50.333
174	2	53.086
184	4 1/2	56.198
185	4 1/2	56.502
187	11	57.277
202	5 1/8	61.700
236	1 1/4	71.965

AC	RD	P	SQ M
-	-	6 3/4	170.7
-	-	9 3/4	246.6
-	-	10	252.9
-	-	33 3/4	853.6
-	1	3 3/4	1107

I, Bruce Richard Davies, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 15th day of November, 1977

This margin to be left free from notation

This is the plan marked "A" referred to in ... Dated ...

Signatures of parties to be made in this margin.

1

Req:R854593 /Doc:DP 0164798 P /Rev:22-Dec-1992 /Sts:OK.OK /Pgs:ALL /Prt:08-Jun-2016 14:49 /Seq:1 of 1
Refals /Src:T

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R854715 /Doc:CT 13043-002 CT /Rev:16-Dec-2010 /Sts:OK.OK /Pgs:ALL /Prt:08-Jun-2016 14:56 /Seq:1 of 6
Ref:als /Src:T

[redacted]CATE OF TITLE
[redacted]OPERTY ACT, 1900

13043002

NEW SOUTH WALES

Vol. 13043 Fol. 2

First Title Old System

Prior Title IVA 17975

EDITION ISSUED 9 7 1986

CANCELLED

I certify that the person named in the First Schedule is the registered proprietor of an estate in fee simple (or such other estate or interest as is set out below) in the land described subject to the recordings appearing in the Second Schedule and to the provisions of the Real Property Act, 1900.

Registrar General.

Vol. 13043 Fol. 2

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON (Page 1) Vol.

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

LAND REFERRED TO

S Lot 1 in DP164798 at Penrith in the City of Penrith Parish of Castlereagh County of Cumberland.

Title Diagram: DP164798.

FIRST SCHEDULE

NEVAT PTY. LIMITED.

R966699

SECOND SCHEDULE

GRY
1. Reservations and conditions in the Crown grant.
L 2. R784549 P Lease to Douglas Steele Timmins and Michael John Maxwell, as Joint Tenants of lock-up premises known as 1st Floor, 134 Henry Street, Penrith. Expires 28-9-1984. Option of renewal 5 years.
M 3. R966700 P Mortgage to Permanent Nominees (Aust.) Limited.
~~4. T191783 Lease to Chambers Terence Beaumont and Mary Veronica Beaumont, as Joint Tenants of premises being Shop 2, 134 Henry Street, Penrith. Expires 28-9-1983. Option of renewal 3 years.~~ W495589
U(L) 5. R784549 P Lease T191788 Transfer of lease. Lessee now Penrith Professional Services Pty. Limited.
6. ~~T561147 Lease to Nahil Pty. Limited of premises being Shop 3, 134 Henry Street, Penrith. Expires 28-9-1987.~~ X836404 15-9-1988
7. ~~V528167 Lease to Mary Farrell and Brenda Murray, as Tenants in Common of premises being Shop 1A, 134 Henry Street, Penrith together with rights. Expires 31-1-1987. Option of renewal 3 years.~~ 6-11-1987
8. ~~V608741 Lease to Mary Farrell and Brenda Murray, as Tenants in Common of premises being Shop 1B, 134 Henry Street, Penrith together with rights. Expires 31-1-1987. Option of renewal 2 years.~~ 6-11-1987
U(VM) 9. R966700 P Mortgage V882540 Variation of mortgage.
~~10. V891878 Lease to Julie Joan Russell and Glenys Lorraine Lawless, as Tenants in Common of premises being Shop 2, 134 Henry Street, Penrith. Expires 7-3-1988. Option of renewal 3 years.~~ W495588
BF 11. This edition has been issued because of the reported loss of the edition issued 30-4-1976.

9.7.1986

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R854715 /Doc:CT 13043-002 CT /Rev:16-Dec-2010 /Sts:OK.OK /Pgs:ALL /Prt:08-Jun-2016 14:56 /Seq:2 of 6

Ref:als /Src:T

Vol 13043 Fol 2

LO 55

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR

Registrar General

SECOND SCHEDULE (continued)

PARTICULARS	Registrar General	CANCELLATION
~~W495588 Lease to Graeme John Fooks, Christel Fooks and Jens Michael Kuebler as joint tenants of premises [redacted] Took-up shop 2, 134 Henry Street Penrith Expires 30-1-1989 with an option of renewal for 3 years Registered 22-9-1986~~		Z392886
W603712 P Mortgage to Westpac Banking Corporation Registered 24-11-1986		
~~W994054 Lease to Mary Farrell and Brenda Murray as tenants in common in equal shares of premises being Shops 1A and 1B, 134 Henry Street, Penrith. Expires 31-1-1990 with an option of renewal for 3 years. Registered 6-11-1987~~		Z99883 9-8-1990
~~W994054 Lease X512062 Transfer of Lease to Ronald Ironside Hardie and Cynthia Anne Hardie as joint tenants. Registered 10-6-1988~~		
X836404 P Lease to Nohil Pty. Limited of premises known as Shop 3, 134 Henry Street, Penrith. Expires 28-9-1992. Option of renewal for 5 years. Registered 15-9-1988		
Z99883 P Lease to Fouad Nassif and Isis Nassif as joint tenants of premises being Shops 1A and 1B, 134 Henry Street, Penrith. Expires 6-4-1992. Option of renewal for 3 years. Registered 9-8-1990		
Z 741940 P [redacted] Harvey Burdett of Penrith, Unit 2, 1st Floor, 134 Henry Street, Penrith. Expires 31-1-1993. Option of Renewal 3 years. Registered 11-7-1991.		

CANCELLED

[redacted]

SEE NEW FOLIO

NOTATIONS AND UNREGISTERED DEALINGS

W495588 R
9 L
pennies
90 c/c
W603712 MR
W994054 L
pennies
- see
X512062 TL
R
X836404 Lse R
Z 99883 TL R
Z392886 DL R

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Version: 1, Version Date: 14/04/2021

Req:R854715 /Doc:CT 13043-002 CT /Rev:16-Dec-2010 /Sts:OK.OK /Pgs:ALL /Prt:08-Jun-2016 14:56 /Seq:3 of 6
Ref:als /Src:T

CERTIFICATE OF TITLE

QUALIFIED
TORRENS TITLE
Register

NEW SOUTH WALES

REAL PROPERTY ACT, 1900

Vol. 13043 Fol. 2
CANCELLED

See new edition
Edition issued 30-4-1976

IVA NO. 17975

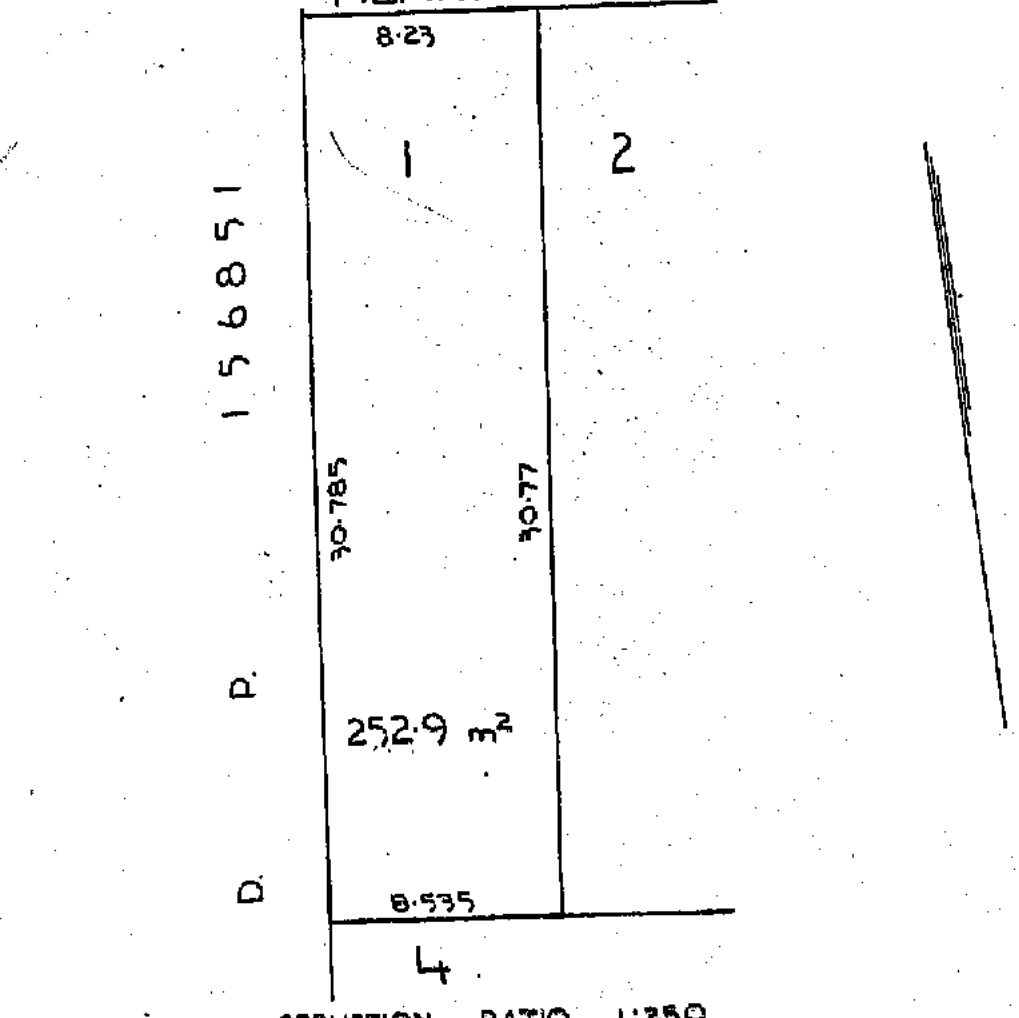
(Page 1) Vol. 13043 Fol. 2

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

Registrar General.

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



REDUCTION RATIO 1:250

IVA 17975

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 1 in Deposited Plan 164798 at Penrith in the City of Penrith Parish of Castlereagh and County of Cumberland being part of Portion 90 granted to Daniel Woodriff on 18-12-1805.

FIRST SCHEDULE

~~GEOFFREY HOWARD UPTON of Emu Plains, Retired Garage Proprietor.~~

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
2. ~~CAUTION. The land within described is held subject to any subsisting interest (as defined in Section 28A of the Real Property Act, 1900).~~ Cancelled V882539
3. ~~Caveat No.P676436 by the Registrar General as regards part.~~ Withdrawn Q615090

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Version: 1, Version Date: 14/04/2021
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Fol.

Vol.

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	REGISTERED	Signature of Registrar General
		~~Q615090~~		
		~~Q615088~~		
~~Peredon Pty. Limited~~	~~Transfers~~	~~Q514221~~	~~19-4-1978~~	
Nevat Pty. Limited	Transfer	R966699	8-8-1980	

P926200 Plan
Q514221 T.
DG 1087 M/P
-90 Le
-85 Le
-91 M
CT 3.7.79
CT-25.10.79
R557433 Lse
3 LR
R784549 Lse
1st Floor, 134 Henry St
R869074 Lse
Shop 2, Gaymark Lane
R930162 Lse
R931338 Lse
R966698 DM
- 699 Te
- 700 M/P
CT-21.7.82
T191783 Lse
- 84 Le
- 85 L
- 86 Le
- 87 TL
- 88 M
CT 24.11.83
CT 30.8.84
CT 19.6.80
R869074 Lse
R930162 X R
R931338 Lse
R966698 DM/P
Vol.
130/73

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION	
~~Caveat~~	~~P926200~~		~~26-10-1976~~		Withdrawn	Q615087
~~Mortgage~~	~~Q615091~~	~~to The National Bank of Australasia Limited~~	~~19-4-1978~~		Discharged	R966698
~~Lease~~	~~R557433~~	~~of premises known as Shop 2, Cnr. Gaymark Lane and Henry Street, Penrith, together with option of renewal, to Terence Beaumont of Penrith, Hairdresser and Mary Beaumont his wife as joint tenants. Expires 28-9-1983~~	~~9-4-1980~~		Expired	8-9-1982
Lease	R784549	to Douglas Steele Timmins and Michael John Maxwell both Solicitors of Penrith as joint tenants of premises being lock up premises known as 1st Floor, 134 Henry St, Penrith with an option of renewal. Date of Expiry 28-9-1984.	9-7-1980			
~~Lease~~	~~R869074~~	~~to Ista Hotel Developments Pty Limited part being lock up shop premises known as Shop 1 corner of Gaymark Lane and Henry Street Penrith with an option of renewal. Date of Expiry 28-9-1980~~	~~9-7-1980~~		~~Expired~~	~~8-9-1982~~
Caveat	R930162	by 1st 60 Minute Cleaners Pty Limited	9-7-1980.		Lapsed	R931338
~~Lease~~	~~R931338~~	~~to 1st 60 Minute Cleaners Pty Limited part being premises known as Shop 3 "Timmins House" Corner Henry Street and Gaymark Lane Penrith with an option of renewal Date of Expiry 28-9-1982~~	~~9-7-1980~~		~~Expired~~	~~12-9-1983~~
Mortgage	R966700	to Permanent Nominees (Aust.) Limited	8-8-1980			
T191783	Lease to Charles Terence Beaumont and Mary Veronica Beaumont as joint tenants of premises known as Shop 2, 134 Henry Street, Penrith, together with option of renewal. Expires 28-9-1983. Registered 8-9-1982.					

(Page 2 of 2 pages)

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Document Set ID: 9947379
Version: 1, Version Date: 14/04/2021

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR | Registrar General

SECOND SCHEDULE (continued)

PARTICULARS	Registrar General	CANCELLATION
T191785 Lease to Ronald Theodore Spriilane and Sheila Margaret Spriilane as joint tenants of premises known as Shop 1, 134 Henry Street, Penrith, together with option of renewal. Expires 15.3.1984. Registered 8-9-1982.		V328166
T191785 Lease. Lessees: Ronald James Boardman and Mavis Isobel Boardman as joint tenants by Transfer T191787. Registered 8-9-1982.		T347506
R784549 Lease. Lessees: Penrith Professional Services Pty. Limited by Transfer T191788. Registered 8-9-1982.		
T191785 Lease: Lessee Betty Seward and Glenda Ruby McMurtrie as tenants in common by Transfer T347506. Registered 23-12-1982		V328166
T561147 Lease to Nohil Pty. Limited of premises being Shop 3, 134 Henry Street, Penrith. Registered 12-9-1983		
V328167 Lease to Mary Farrell and Brenda Murray as tenants in common of Shop 1A, 134 Henry Street, Penrith, reserving rights. Expires 31-1-1987. Option of renewal see V328167. Registered 18-9-1984		
V608741 Lease to Mary Farrell and Brenda Murray as tenants in common of shop 1B, 134 Henry Street, Penrith together with rights. Expires 31-1-1987. Option of renewal 2 years. Registered 12-3-1985		
R966700 Mortgage V882540 Variation. Registered 22.8.1985.		
V891878 Lease to Julie Jean Russell and Glenys Lorraine Lawless as tenants in common of Shop 2, 134 Henry Street, Penrith. Expires 7-3-1988. Option of renewal 3 years. Registered 20-9-1985		

CANCELLED

SEE AUTO FOLIO

NOTATIONS AND UNREGISTERED DEALINGS

T347506 C.T. 12.5.83 Transfer to Spriilane - Seen.
V328166 TL R Seen
CT 25-2-85
V608741 Lse (2) C/C
V881539 Lse - Seen
V891878 L
Z741940 Lse Cancr 2, 134 Fol

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Vol. 43 Fol. 2

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR | Registrar General

CANCELLED

See new edition issued 9/7/1986.

Vide ~~W357086.~~
1976M287(323)

SECOND SCHEDULE (continued)

PARTICULARS | Registrar General | CANCELLATION

CANCELLED

SEE AUTO FOLIO

NOTATIONS AND UNREGISTERED DEALINGS

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Req:R854725 /Doc:CT 15457-157 CT /Rev:04-Mar-2011 /Sts:OK.SC /Pgs:ALL /Prt:08-Jun-2016 14:56 /Seq:1 of 2
Ref:als /Src:T

[redacted]

CATE OF TITLE

PROPERTY ACT, 1900

15457157

NEW SOUTH WALES

Vol. 15457 Fol. 157

First Title Vol. 13169 Fol. 107

Prior Title Vol. 13169 Fol. 107

SEE AUTO FOLIO

ISSUED 9 7 1966

I certify that the person named in the First Schedule is the registered proprietor of an estate in fee simple (or such other estate or interest as is set out below) in the land described subject to the recordings appearing in the Second Schedule and to the provisions of the Real Property Act, 1900.

Registrar General.

LAND REFERRED TO

Lot 1 in DP252457 at Penrith in the City of Penrith Parish of Castlereagh County of Cumberland.

Title Diagram: DP252457.

FIRST SCHEDULE

NEVAT PTY. LIMITED. R966699

SECOND SCHEDULE

GXM 1. Land excludes minerals and is subject to reservations and conditions in favour of the Crown - see Crown grant.

XL 2. Excepting the land below a depth from the surface of 20 metres by the Crown grant.

M 3. R966700 Mortgage to Permanent Nominees (Aust.) Limited.

L 4. V328167 Lease to Mary Farrell and Brenda Murray, as Tenants in Common of premises being Shop 1A, 134 Henry Street, Penrith together with rights. Expires 31-1-1987. Option of renewal 3 years.

L 5. V608741 Lease to Mary Farrell and Brenda Murray, as Tenants in Common of premises being Shop 1B, 134 Henry Street, Penrith together with rights. Expires 31-1-1987. Option of renewal 2 years.

U(VM) 6. R966700 Mortgage V882540 Variation of mortgage.

~~7. V891878 Lease to Julie Jean Russell and Glenys Lorraine Lawless, as Tenants in Common of premises being Shop 2, 134 Henry Street, Penrith. Expires 7-3-1988. Option of renewal 3 years~~ W495588

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

(Page 1) Vol. 15457 Fol. 157

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Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

L.O. 55

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	Registrar General

SECOND SCHEDULE (continued)

PARTICULARS	Registrar General	CANCELLATION
W495589 Lease to Graeme John Fooks, Christel Fooks and Jens Michael Kuebler as joint tenants of premises being lock-up shop 2, 134 Henry Street Penrith Expires 30-4-1989 with an option of renewal for 3 years Registered 22-9-1986 W603712 MORTGAGE to Westpac Banking Corporation Registered 24-11-1986		

NOTATIONS AND UNREGISTERED DEALINGS

W495589 R
9 L
premises
to cc
W603712 MR

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Ref:als /Src:T

Req:R854834 /Doc:CT 13169-107 CT /Rev:23-Dec-2010 /Sts:OK.OK /Pgs:ALL /Prt:08-Jun-2016 15:02 /Seq:1 of 2
Ref:ALS /Src:T

STATE OF SOUTH WALES

[redacted]

CROWN GRANT

13169107

No. 1976/2574

FREE

Vol [redacted] Fol [redacted]
Registered 11-11-1976

CANCELLED W

Registrar General

(Page 1) Vol. 13169 Fol. 107

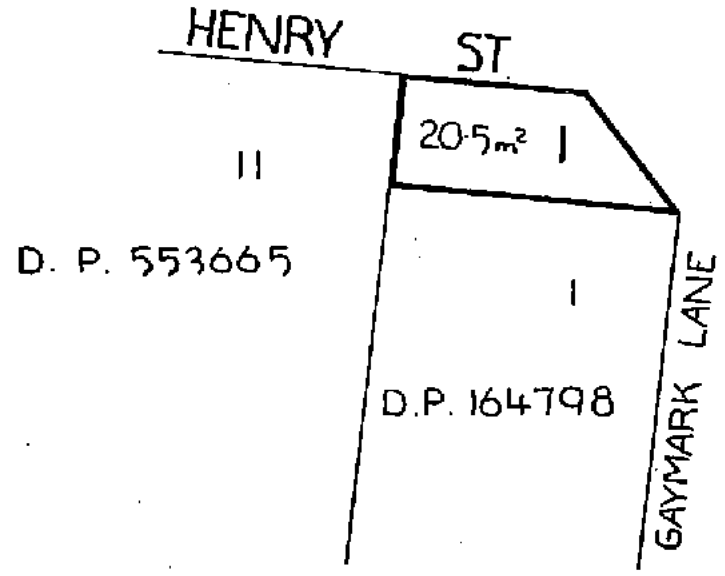
We, Elizabeth the Second, by the Grace of God Queen of Australia and Her other Realms and Territories, Head of the Commonwealth, do hereby grant to the person described in the First Schedule an Estate in Fee Simple in the land within described, subject nevertheless to such reservations, conditions and other provisions as are shown in the Second Schedule. In testimony whereof We have caused this Our Grant to be sealed with the seal of Our said State

Witness Our Governor of Our State of New South Wales and its Dependencies in the Commonwealth of Australia, at Sydney in Our said State, this twenty seventh day of October in the twenty fifth year of Our Reign and in the year of Our Lord one thousand nine hundred and seventy six.

Governor

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



REDUCTION RATIO 1:200

LAND REFERRED TO

Lot 1 in Deposited Plan 252457 in the City of Penrith Parish of Castlereagh and County of Cumberland.
EXCEPTING THEREOUT the land below a depth of 20 metres from the surface.

FIRST SCHEDULE

~~GEOFFREY HOWARD UPTON of 192 Nepean Street Emu Plains as to an undivided one-fourth share, ZENDA MERLE UPTON of 192 Nepean Street Emu Plains as to an undivided one-fourth share and MARK HOWARD UPTON of 192 Nepean Street Emu Plains as to the remaining undivided one half share, as Tenants in Common.~~

SECOND SCHEDULE

1. We do hereby reserve and except unto Us Our Heirs and Successors all minerals which the land hereby granted contains with full power and authority for Us Our Heirs and Successors and such person or persons as shall from time to time be authorised by Us or Them to enter upon the land hereby granted and to search for mine dig and remove the said minerals and also all such parts and so much of the land hereby granted as may hereafter be required for public ways in over and through the same to be set out by Our Governor for the time being of Our said State or some person by him authorised in that respect with full power for Us Our Heirs and Successors and for Our Governor as aforesaid by such person or persons as shall be by Us Them or him authorised in that behalf to make and conduct all such public ways And the right of full and free ingress egress and regress into out of and upon the land hereby granted for the several purposes aforesaid or any of them Provided Further and it is expressly declared that mining operations may have been and may be carried on upon and in the land below the land hereby granted and the lands adjoining the land hereby granted and the land below the same and metals and minerals may have been and may be removed therefrom and that these presents are made upon and subject to the condition that neither the Grantee or Grantees nor his her their or its sequels in title shall be entitled to make or prosecute any claim for damages or take any proceedings either by way of injunction or otherwise against Us Our Heirs and Successors or the Government of Our said State or any lessee or lessees under any Mining Act or Acts of Our said State or his or their executors administrators or assigns for or in respect of any damage or loss occasioned by the letting down subsidence or lateral movement of the land hereby granted or otherwise howsoever by reason of the following acts and matters that is to say by reason of Us Our Heirs or Successors or the Government of Our said State or any person on Our Their or its behalf or any lessee or lessees as aforesaid or his or their executors administrators or assigns having worked or now or hereafter working any mines or having carried on or now or hereafter carrying on mining operations or having searched for worked won or removed or now or hereafter searching for working winning or removing any metals or minerals under in or from the land below the land hereby granted or on in under or from any other lands situated laterally to the land hereby granted and the land below the same and whether on or below the surface of such other lands Provided Lastly and we do hereby expressly reserve unto Us Our Heirs and Successors the liberty and authority by reason of the acts and matters aforesaid or in the course thereof for Us Our Heirs and Successors and the Government of Our said State and any person on Our Their or its behalf and any lessee or lessees as aforesaid and his or their executors administrators and assigns to from time to time let down without payment of any compensation whatsoever any part of the land hereby granted and/or of the surface thereof.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

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Document Set ID: 9947479
Version: 1, Version Date: 14/04/2021

Vol. 13169 Fol. 107

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	REGISTERED	Signature of Registrar General
~~Daredon Pty. Limited~~	~~Transfers~~	~~9615089~~ ~~9514221~~	~~19-4-1978~~	
Nevat Pty. Limited	Transfer	R966699	8-8-1980	

This Deed is cancelled and Certificate of Title issued
Vol 15457 Fol 157 dated 9-7-1986.
Vide ~~G325786~~ 1976 11287 (323)

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION	
~~Mortgage~~	~~9615091~~	~~to The National Bank of Australasia Limited~~	~~19-4-1978~~		Discharged	R966698
Mortgage	R966700	to Permanent Nominees (Aust.) Limited	8-8-1980			
V328167		Lease to Mary Farrell and Brenda Murray as tenants in common of Shop 1A, 134 Henry Street, Penrith, reserving rights. Expires 31-1-1987. Option of renewal see V328167. Registered 18-9-1984				
V608741		Lease to Mary Farrell and Brenda Murray as tenants in common of shop 1B, 134 Henry Street, Penrith together with rights. Expires 31-1-1987. Option of renewal 2 years. Registered 12-3-1985				
R966700		Mortgage V882540 Variation. Registered 22.8.1985.				
V891878		Lease to Julie Jean Russell and Glenys Lorraine Lawless as tenants in common of Shop 2, 134 Henry Street, Penrith. Expires 7-3-1988. Option of renewal 3 years. Registered 20-9-1985				

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Q514221/2a.
Q615089/2a
-91 M
R966698 01/M
-699 Te
-700 M
CT 30.8.84
V328166DL
7L
8cc
CT 25.2.85
V608741 LSE
(R) 2 c/c
V882540 VM R
L891878 L

Ref:ALS /Src:T
Req:R854834 /Doc:CT 13169-107 CT /Rev:23-Dec-2010 /Sts:OK.OK /Pgs:ALL /Prt:08-Jun-2016 15:02 /Seq:2 of 2

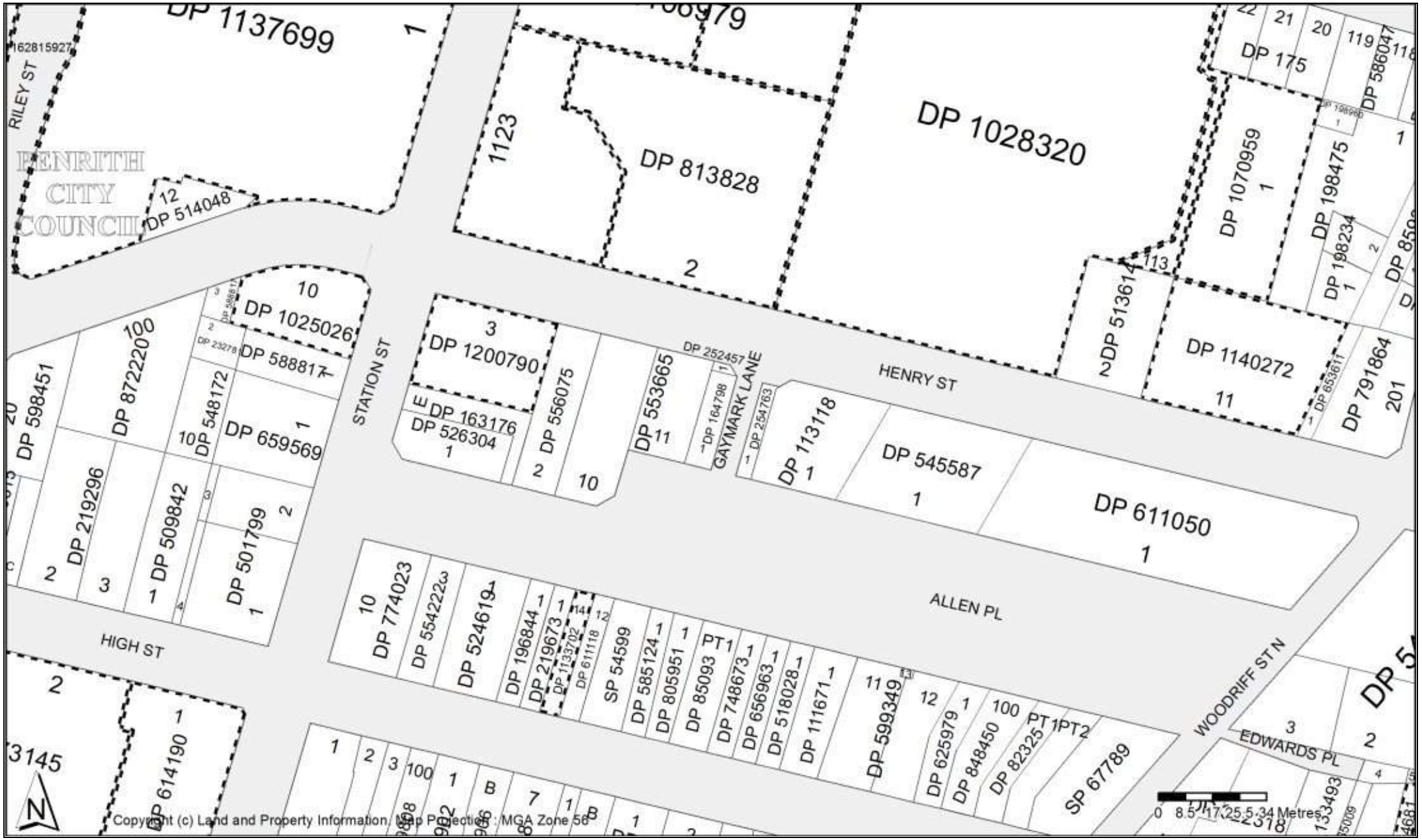
Land & Property Information

Cadastral Records Enquiry Report

Ref : geo logix - penrith

Requested Parcel : Lot 1 DP 164798 **Identified Parcel :** Lot 1 DP 164798

Locality : PENRITH **LGA :** PENRITH **Parish :** CASTLEREAGH **County :** CUMBERLAND



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This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

	Status	Surv/Comp	Purpose
DP573145			
Lot(s): 2			
DP1093917	REGISTERED	SURVEY	EASEMENT
DP614190			
Lot(s): 1			
DP1093917	REGISTERED	SURVEY	EASEMENT
DP813828			
Lot(s): 2			
DP649949	REGISTERED	SURVEY	EASEMENT
DP1025026			
Lot(s): 10			
DP3811	HISTORICAL	COMPILATION	UNRESEARCHED
DP215810	HISTORICAL	SURVEY	SUBDIVISION
DP588817	HISTORICAL	SURVEY	SUBDIVISION
DP1028320			
Lot(s): 111, 113			
DP813305	HISTORICAL	SURVEY	SUBDIVISION
Lot(s): 111			
DP567113	HISTORICAL	SURVEY	SUBDIVISION
DP1070959			
Lot(s): 1			
CA105521 - LOT 1 DP1070959			
DP1106979			
Lot(s): 1121, 1122			
DP1135325	REGISTERED	SURVEY	EASEMENT
Lot(s): 1121, 1122, 1123			
DP649949	REGISTERED	SURVEY	EASEMENT
DP813305	HISTORICAL	SURVEY	SUBDIVISION
DP813828	HISTORICAL	SURVEY	SUBDIVISION
DP1028320	REGISTERED	SURVEY	SUBDIVISION
DP1133702			
Lot(s): 14			
DP996203	HISTORICAL	COMPILATION	DEPARTMENTAL
DP1134681			
Lot(s): 1, 2			
DP557938	HISTORICAL	SURVEY	OLD SYSTEM CONVERSION
DP1137699			
Lot(s): 1			
DP216074	HISTORICAL	SURVEY	SUBDIVISION
DP265968	REGISTERED	SURVEY	EASEMENT
DP410210	HISTORICAL	SURVEY	UNRESEARCHED
DP500416	HISTORICAL	SURVEY	SUBDIVISION
DP533437	HISTORICAL	SURVEY	OLD SYSTEM CONVERSION
DP732647	HISTORICAL	SURVEY	SUBDIVISION
DP838756	HISTORICAL	SURVEY	CONSOLIDATION
DP841459	HISTORICAL	COMPILATION	CONSOLIDATION
DP862624	HISTORICAL	SURVEY	CONSOLIDATION
DP1001461	REGISTERED	SURVEY	REDEFINITION
DP1082989	HISTORICAL	SURVEY	ROADS ACT, 1993
DP1085231	HISTORICAL	SURVEY	ROADS ACT, 1993
DP1086586	REGISTERED	SURVEY	SUBDIVISION
NSW GAZ. 28-06-2002 Folio : 5042 DEDICATED PUBLIC ROAD THE PART OF JANE STREET SHOWN IN DP976320			
NSW GAZ. 29-07-2005 Folio : 3966 CLOSED ROAD LOTS 32-33 DP1082989 - SEE AB724176			
NSW GAZ. 29-07-2005 Folio : 3966 CLOSED ROAD LOTS 32-33 IN DP1082989			

Caution: For all **ACTIVITY PRIOR to SEPT 2002** you must refer to the RGs Charting and Reference Maps.

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Requested Parcel : Lot 1 DP 164798 **Identified Parcel :** Lot 1 DP 164798

Locality : PENRITH **LGA :** PENRITH **Parish :** CASTLEREAGH **County :** CUMBERLAND

	Status	Surv/Comp	Purpose
DP1140272			
Lot(s): 11			
DP234350	HISTORICAL	SURVEY	OLD SYSTEM CONVERSION
DP609693	HISTORICAL	SURVEY	OLD SYSTEM CONVERSION
DP1159119			
Lot(s): 1			
CA156023 - LOTS 1-3 DP1159119			
DP1200790			
Lot(s): 3			
DP158845	HISTORICAL	SURVEY	UNRESEARCHED
Road			
Polygon Id(s): 162815927			
NSW GAZ. 21-10-2005 Folio : 8879 CLOSED ROAD LOTS 34-37 IN DP1085231 - STRATUM LOTS			
CA94915 - LOTS 34-37 DP1085231			

Caution: For all **ACTIVITY PRIOR to SEPT 2002** you must refer to the RGs Charting and Reference Maps.

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Version: 1, Version Date: 14/04/2021

Plan	Surv/Comp	Purpose
DP175	COMPILATION	UNRESEARCHED
DP82325	SURVEY	UNRESEARCHED
DP85093	SURVEY	UNRESEARCHED
DP111671	COMPILATION	DEPARTMENTAL
DP113118	COMPILATION	DEPARTMENTAL
DP133493	COMPILATION	DEPARTMENTAL
DP156615	SURVEY	UNRESEARCHED
DP160906	SURVEY	UNRESEARCHED
DP163176	SURVEY	UNRESEARCHED
DP164798	SURVEY	UNRESEARCHED
DP196844	COMPILATION	DEPARTMENTAL
DP198234	COMPILATION	DEPARTMENTAL
DP198253	COMPILATION	DEPARTMENTAL
DP198475	COMPILATION	DEPARTMENTAL
DP198960	COMPILATION	DEPARTMENTAL
DP219296	SURVEY	SUBDIVISION
DP219673	SURVEY	OLD SYSTEM CONVERSION
DP227238	SURVEY	OLD SYSTEM CONVERSION
DP232781	SURVEY	SUBDIVISION
DP236390	SURVEY	RESUMPTION OR ACQUISITION
DP252457	COMPILATION	CROWN FOLIO CREATION
DP254763	SURVEY	ROADS ACT, 1993
DP322318	SURVEY	UNRESEARCHED
DP365009	SURVEY	UNRESEARCHED
DP501799	SURVEY	SUBDIVISION
DP509842	SURVEY	OLD SYSTEM CONVERSION
DP513146	SURVEY	SUBDIVISION
DP513614	SURVEY	SUBDIVISION
DP514048	SURVEY	SUBDIVISION
DP518028	COMPILATION	DEPARTMENTAL
DP524619	SURVEY	OLD SYSTEM CONVERSION
DP526304	SURVEY	OLD SYSTEM CONVERSION
DP545587	SURVEY	OLD SYSTEM CONVERSION
DP546822	SURVEY	SUBDIVISION
DP548172	SURVEY	OLD SYSTEM CONVERSION
DP553665	SURVEY	OLD SYSTEM CONVERSION
DP554222	SURVEY	SUBDIVISION
DP556075	SURVEY	OLD SYSTEM CONVERSION
DP573145	SURVEY	OLD SYSTEM CONVERSION
DP585124	SURVEY	OLD SYSTEM CONVERSION
DP586047	SURVEY	SUBDIVISION
DP588817	SURVEY	SUBDIVISION
DP597310	SURVEY	OLD SYSTEM CONVERSION
DP598451	SURVEY	OLD SYSTEM CONVERSION
DP599349	COMPILATION	SUBDIVISION
DP611050	SURVEY	OLD SYSTEM CONVERSION
DP611118	SURVEY	OLD SYSTEM CONVERSION
DP614190	SURVEY	CONSOLIDATION
DP625979	SURVEY	OLD SYSTEM CONVERSION
DP633902	COMPILATION	CONSOLIDATION
DP649808	SURVEY	REDEFINITION
DP653611	COMPILATION	DEPARTMENTAL
DP656963	COMPILATION	DEPARTMENTAL
DP659569	COMPILATION	DEPARTMENTAL
DP748673	SURVEY	OLD SYSTEM CONVERSION
DP774023	COMPILATION	CONSOLIDATION
DP791864	SURVEY	OLD SYSTEM CONVERSION
DP805951	SURVEY	OLD SYSTEM CONVERSION
DP813828	SURVEY	SUBDIVISION
DP848450	SURVEY	PRIMARY APPLN NON SUBDIVISION
DP854975	SURVEY	SUBDIVISION
DP859371	SURVEY	ROADS ACT, 1993
DP872220	SURVEY	CONSOLIDATION
DP877408	SURVEY	PRIMARY APPLN NON SUBDIVISION
DP995047	COMPILATION	DEPARTMENTAL
DP1025026	SURVEY	CONSOLIDATION
DP1028320	SURVEY	SUBDIVISION
DP1070959	COMPILATION	DEPARTMENTAL
DP1106979	SURVEY	SUBDIVISION

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Plan	Surv/Comp	Purpose
DP1133702	SURVEY	REDEFINITION
DP1134681	SURVEY	SUBDIVISION
DP1137699	SURVEY	SUBDIVISION
DP1140272	COMPILATION	CONSOLIDATION
DP1159119	COMPILATION	LIMITED FOLIO CREATION
DP1200790	SURVEY	DELIMITATION
SP54599	COMPILATION	STRATA PLAN
SP67789	COMPILATION	STRATA PLAN

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ATTACHMENT F

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Geo-Logix
environment • geotech

GEO-LOGIX PTY LTD

UNIT 2309, 4 DAYDREAM ST
WARRIEWOOD NSW 2102

Ph: (02) 9979 1722

Aerial Photograph – 1943

PHASE I ENVIRONMENTAL SITE ASSESSMENT

134 – 138 Henry Street

Project No. 1601069 Drawn: AM Checked: BP Date: 09/08/2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

GEO-LOGIX PTY LTD
UNIT 2309, 4 DAYDREAM ST
WARRIEWOOD NSW 2102

Ph: (02) 9979 1722

Aerial Photograph – 1956

PHASE I ENVIRONMENTAL SITE ASSESSMENT

134 – 138 Henry Street

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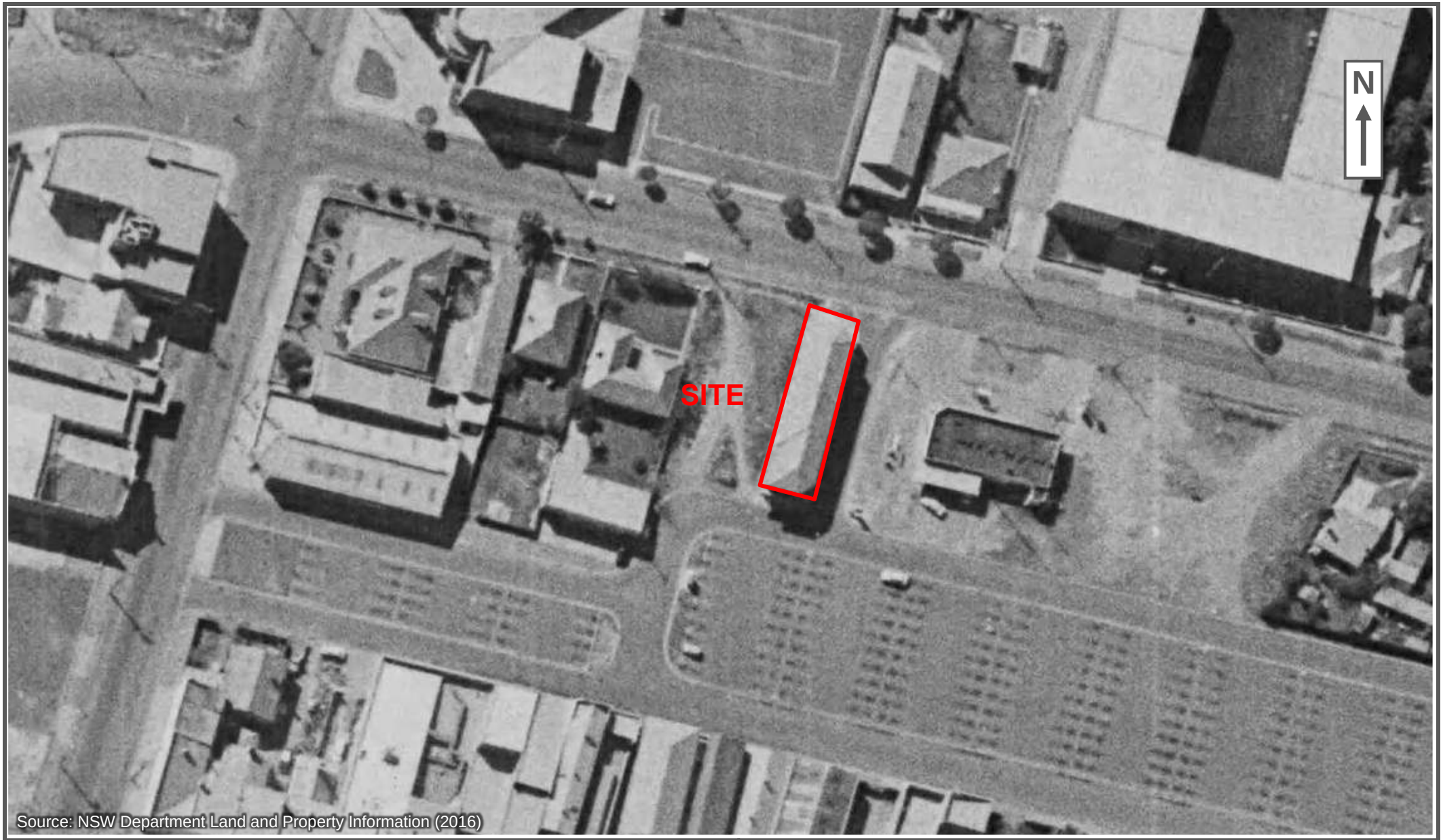

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Ph: (02) 9979 1722

Aerial Photograph – 1965

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Ph: (02) 9979 1722

Aerial Photograph – 1975

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UNIT 2309, 4 DAYDREAM ST
WARRIEWOOD NSW 2102

Ph: (02) 9979 1722

Aerial Photograph – 1986

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GEO-LOGIX PTY LTD

UNIT 2309, 4 DAYDREAM ST
WARRIEWOOD NSW 2102

Ph: (02) 9979 1722

Aerial Photograph – 1994

PHASE I ENVIRONMENTAL SITE ASSESSMENT

134 – 138 Henry Street

Project No. 1601069 Drawn: AM Checked: BP Date: 09/08/2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

GEO-LOGIX PTY LTD
UNIT 2309, 4 DAYDREAM ST
WARRIEWOOD NSW 2102

Ph: (02) 9979 1722

Aerial Photograph – 2006

PHASE I ENVIRONMENTAL SITE ASSESSMENT

134 – 138 Henry Street

Project No. 1601069 Drawn: AM Checked: BP Date: 09/08/2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Geo-Logix
environment • geotech

GEO-LOGIX PTY LTD

UNIT 2309, 4 DAYDREAM ST
WARRIEWOOD NSW 2102

Ph: (02) 9979 1722

Aerial Photograph – 2016

PHASE I ENVIRONMENTAL SITE ASSESSMENT

134 – 138 Henry Street

Project No. 1601069 Drawn: AM Checked: BP Date: 09/08/2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

ATTACHMENT G

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 5947979
Version: 1, Version Date: 14/04/2021

PENRITH CITY COUNCIL
-8 SEP 1977

Vac Unit attached to wall inside building above Blow Down Tanks.

AIR VAC UNIT WALL MOUNTED

W.C.

ELECTRIC BOILER

FEED WATER PUMP

BLOW DOWN TANK

STEAM IRON

AJAX 646 PRESS

AJAX TOPPER

AIR COMPRESSOR IN THIS AREA

HUERSCH CABINET

UTILITY PRESS

INDEX CONVEYOR

RENZACCI Royal 40

SPOTTING BOARD

HENRY ST

GAYMARK LANE

PROPOSED LAYOUT:- JET 60 MIN D/C

L. DEE PTY. LTD. SEPT. 77.

SCALE ½ inch = 1 foot.

ATTACHMENT H

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

SafeWork NSW
92-100 Donnison Street, Gosford, NSW, 2250
Locked Bag 2906, Lisarow, NSW, 2252 |
Customer Service Centre 13 10 50
licensing@safework.nsw.gov.au | www.safework.nsw.gov.au

Our Ref: D16/617563
Your Ref: Tim Gunns

29 June 2016

Attention: Tim Gunns
Geo-Logix Pty Ltd
2309/4 Daydream Street
WARRIEWOOD NSW 2102

Dear Mr Gunns

RE SITE: 134-138 Henry Street, Penrith NSW 2750

I refer to your site search request received by SafeWork NSW on 16 June 2016 requesting information on Storage of Hazardous Chemicals for the above site.

A search of the records held by SafeWork NSW has not located any records pertaining to the above mentioned premises.

For further information or if you have any questions, please call our Customer Service Centre on 13 10 50 or email licensing@safework.nsw.gov.au

Yours sincerely,

Sally Anderson obo Brent Jones
Customer Service Officer
Customer Service Centre - Operations
SafeWork NSW

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

ATTACHMENT I

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Contaminated land

+ Management of contaminated land
+ Consultants and site auditor scheme
+ Underground petroleum storage systems
Guidelines under the CLM Act
NEPM amendment
+ Further guidance
– Record of notices
About the record
Search the record
Search tips
Disclaimer
List of NSW contaminated sites notified to EPA
Frequently asked questions
Forms
+ Other contamination issues
+ Contaminated Land Management Program

Home Contaminated land Record of notices

Search results

Your search for: LGA: Penrith City Council

Matched 23 notices relating to 7 sites.

Search Again Refine Search

Suburb	Address	Site Name	Notices related to this site
BERKSHIRE PARK	(Northern end of Compartment 5) The Northern ROAD	Castlereagh State Forest	6 former
COLYTON	88 Great Western HIGHWAY	Ampol Service Station	1 current
JAMISONTOWN	92 Mulgoa ROAD	7-Eleven Service Station	2 current
LUDDENHAM	Lot 4 The Northern ROAD	Elura Liquid Waste Disposal Site	1 current
MULGOA	Mulgoa ROAD	Penrith Waste Services	2 former
PENRITH	Castlereagh ROAD	Crane Enfield Metals	3 current and 3 former
ST MARYS	Vallance STREET	Drum Recycler	5 former

Page 1 of 1

9 August 2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

ATTACHMENT J

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Number	Name	Location
6357	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750
1007008	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750
1020003	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750
1072516	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750
1085783	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750
1104746	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750
1109805	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750
1512576	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750
247	BORAL RESOURCES (NSW) PTY LTD	PEACHTREE ROAD, PENRITH, NSW 2750
12405	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750
1070974	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750
1077652	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750
1109988	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750
1525967	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750
1526072	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750
1098	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750
1017498	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750
1072470	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750
1104995	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750
1512789	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750
1512775	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750
1515690	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750

1525217	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750
10945	CUMMINS SOUTH PACIFIC PTY. LTD.	7 Andrews Road, PENRITH, NSW 2750
1035208	CUMMINS SOUTH PACIFIC PTY. LTD.	7 Andrews Road, PENRITH, NSW 2750
308	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750
1024084	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750
1044228	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750
11290	ENDEAVOUR ENERGY	96-120 Blaikie Road, PENRITH, NSW 2750
1035197	ENDEAVOUR ENERGY	96-120 Blaikie Road, PENRITH, NSW 2750
20381	Glass Recovery Services Pty Ltd	126 Andrews Road, PENRITH, NSW 2740
12132	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750
1097227	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750
1104874	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750
6472	JAMES KEITH COSGROVE	8 HOYLE PLACE, PENRITH, NSW 2750
1044521	JAMES KEITH COSGROVE	8 HOYLE PLACE, PENRITH, NSW 2750
7019	JAMISON PRIVATE HOSPITAL PROPERTY PTY LTD	366 JAMISON ROAD, PENRITH, NSW 2750
2869	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750
1012903	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750
1525246	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750
3741	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750
1007235	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750
1008444	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750
2818	PANASONIC AVC NETWORKS AUSTRALIA PTY LTD	164 STATION STREET, PENRITH, NSW 2750
1048338	PANASONIC AVC NETWORKS AUSTRALIA PTY LTD	164 STATION STREET, PENRITH, NSW 2750

10349	SYDNEY OLYMPIC PARK AUTHORITY	CASTLEREAGH ROAD, PENRITH, NSW 2750
1409	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750
1005313	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750
1017898	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750
1018895	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750
1028330	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750
1032690	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750
1032982	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750
1047700	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750
1061410	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750
1074754	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750
1116048	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750
1129012	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750
1504851	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750
1528922	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750
1538189	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750
11461	TOTAL CONCRETE SOLUTIONS PTY LIMITED	261 COOMBES DRIVE, PENRITH, NSW 2750
1294	VICARY CORPORATION PTY LIMITED	60-62 REGENTVILLE ROAD, PENRITH, NSW 2750
12106	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750
1042219	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750
1065654	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750
1093267	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750

1127751	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750
5269	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750
1066270	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750
1072508	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750
1100623	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750
1526064	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750

Type	Status	Issued date
POEO licence	Issued	07-Jun-00
s.58 Licence Variation	Issued	05-Jul-02
s.58 Licence Variation	Issued	09-Sep-02
s.58 Licence Variation	Issued	20-Aug-07
s.58 Licence Variation	Issued	21-Oct-08
s.58 Licence Variation	Issued	06-Aug-09
s.58 Licence Variation	Issued	26-Feb-10
s.58 Licence Variation	Issued	12-Aug-14
POEO licence	No longer in force	22-Aug-00
POEO licence	Issued	09-Mar-06
s.58 Licence Variation	Issued	30-Jul-07
s.58 Licence Variation	Issued	31-Aug-07
s.58 Licence Variation	Issued	19-Apr-10
s.58 Licence Variation	Issued	31-Oct-14
s.58 Licence Variation	Issued	11-Nov-14
POEO licence	Issued	26-Jun-00
s.58 Licence Variation	Issued	24-Nov-03
s.58 Licence Variation	Issued	20-Sep-07
s.58 Licence Variation	Issued	04-Nov-09
Compliance Audit	Complete	13-Mar-13
s.58 Licence Variation	Issued	19-Mar-13
s.58 Licence Variation	Issued	26-Jul-13

s.58 Licence Variation	Issued	26-Sep-14
POEO licence	Surrendered	19-Jun-00
s.58 Licence Variation	Issued	08-Mar-04
POEO licence	Surrendered	17-Jan-00
s.58 Licence Variation	Issued	06-Jan-03
s.58 Licence Variation	Issued	08-Feb-05
POEO licence	No longer in force	08-Jan-01
s.58 Licence Variation	Issued	08-Mar-04
POEO licence	Pending	
POEO licence	Surrendered	01-Oct-04
s.58 Licence Variation	Issued	02-Feb-09
s.58 Licence Variation	Issued	17-Aug-09
POEO licence	Surrendered	21-Jun-00
s.58 Licence Variation	Issued	16-Feb-05
POEO licence	Surrendered	20-Mar-01
POEO licence	Issued	05-Jun-00
s.58 Licence Variation	Issued	18-Feb-02
s.58 Licence Variation	Issued	02-Oct-14
POEO licence	Surrendered	31-Jan-01
s.58 Licence Variation	Issued	10-May-01
s.58 Licence Variation	Issued	20-Aug-01
POEO licence	Surrendered	24-Mar-00
s.58 Licence Variation	Issued	31-May-05

POEO licence	Surrendered	06-Jan-00
POEO licence	Issued	25-May-00
s.58 Licence Variation	Issued	22-Oct-01
s.58 Licence Variation	Issued	26-Jun-02
s.58 Licence Variation	Issued	23-Dec-02
s.58 Licence Variation	Issued	08-Jul-03
s.58 Licence Variation	Issued	25-Nov-03
s.58 Licence Variation	Issued	19-Mar-04
s.58 Licence Variation	Issued	30-Jun-05
s.58 Licence Variation	Issued	29-Jun-06
s.58 Licence Variation	Issued	27-Jun-07
s.58 Licence Variation	Issued	02-Jul-10
s.58 Licence Variation	Issued	27-Jun-11
s.58 Licence Variation	Issued	28-Jun-12
s.58 Licence Variation	Issued	23-Mar-15
s.58 Licence Variation	Issued	19-Feb-16
POEO licence	No longer in force	19-Oct-01
POEO licence	Surrendered	22-Aug-00
POEO licence	Surrendered	28-Apr-04
s.58 Licence Variation	Issued	10-Nov-04
s.58 Licence Variation	Issued	25-Oct-06
s.58 Licence Variation	Issued	10-Nov-08

s.58 Licence Variation	Issued	03-Jun-11
POEO licence	Issued	10-Aug-00
s.58 Licence Variation	Issued	15-Dec-06
s.58 Licence Variation	Issued	23-Jul-07
s.58 Licence Variation	Issued	07-Oct-09
s.58 Licence Variation	Issued	11-Nov-14

ATTACHMENT K

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

List of NSW Contaminated Sites Notified to EPA as of 21 June 2016

Background

A strategy to systematically assess, prioritise and respond to notifications under Section 60 of the *Contaminated Land Management Act 1997* (CLM Act) has been developed by the EPA. This strategy acknowledges the EPA's obligations to make information available to the public under *Government Information (Public Access) Act 2009*.

When a site is notified to the EPA, it may be accompanied by detailed site reports where the owner has been proactive in addressing the contamination and its source. However, often there is minimal information on the nature or extent of the contamination.

For some notifications, the information indicates the contamination is securely immobilised within the site, such as under a building or carpark, and is not currently causing any offsite consequences to the community or environment. Such sites would still need to be cleaned up, but this could be done in conjunction with any subsequent building or redevelopment of the land. These sites may not require intervention under the CLM Act, but could be dealt with through the planning and development consent process.

Where indications are that the nominated site is causing actual harm to the environment or an unacceptable offsite impact (i.e. it is a "significantly contaminated site"), the EPA would apply the regulatory provisions of the CLM Act to have the responsible polluter and/or landowner investigate and remediate the site.

As such, the sites notified to the EPA and presented in the following table are at various stages of the assessment and/or remediation process. Understanding the nature of the underlying contamination, its implications and implementing a remediation program where required, can take a considerable period of time. The tables provide an indication, in relation to each nominated site, as to the management status of that particular site. Further detailed information may be available from the EPA or the responsible landowner.

The following questions and answers may assist those interested in this issue:

Frequently asked questions

What is the difference between the "List of NSW Contaminated Sites Notified to the EPA" and the "Contaminated Land: Record of Notices"?

A site will be on the Contaminated Land: Record of Notices only if the EPA has issued a regulatory notice in relation to the site under the *Contaminated Land Management Act 1997*.

The sites appearing on this "List of NSW contaminated sites notified to the EPA" indicate that the notifiers consider that the sites are contaminated and warrant reporting to the EPA. However, the contamination may or may not be significant enough to warrant regulation by the EPA. The EPA needs to review and, if necessary, obtain more information before it can make a determination as to whether the site warrants regulation.

Why my site appears on the list?

Your site appears on the list because of one or more of the following reasons:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- The site owner and/or the person partly or fully responsible for causing the contamination notified to the EPA about the contamination under Section 60 of the *Contaminated Land Management Act 1997*. In other words, the site owner or the "polluter" believes the site is contaminated.
- The EPA has been notified via other means and is satisfied that the site is or was contaminated.

Does the list contain all contaminated sites in NSW?

No. The list only contains contaminated sites that the EPA is aware of, with regard to its regulatory role under the CLM Act. An absence of a site from the list does not necessarily imply the site is not contaminated.

The EPA relies upon responsible parties to notify contaminated sites.

How are these notified contaminated sites managed by the EPA?

There are different ways that the EPA manages these notified contaminated sites. First, an initial assessment is carried out by the EPA. At the completion of the initial assessment, the EPA may take one or more than one of the following management approaches:

- The contamination warrants the EPA's direct regulatory intervention either under the *Contaminated Land Management Act 1997* or the *Protection of the Environment Operations Act 1997* (POEO Act), or both. Information about current or past regulatory action on this site can be found on EPA website.
- The contamination with respect to the current use or approved use of the site, as defined under the *Contaminated Land Management Act 1997,* is not significant enough that it warrants EPA regulation.
- The contamination does not require EPA regulation and can be managed by a planning approval process.
- The contamination is related to an operational Underground Petroleum Storage System, such as a service station or fuel depot. The contamination may be managed under the POEO Act and the Protection of the Environment Operation (Underground Petroleum Storage Systems) Regulation 2008.
- The contamination is being managed under a specifically tailored program operated by another agency (for example the Department of Industry and Investment's *Derelict Mines Program*).

I am the owner of a site that appears on the list. What should I do?

First of all, you should ensure the current use of the site is compatible with the site contamination. Secondly, if the site is the subject of EPA regulation, make sure you comply with the regulatory requirements, and you have considered your obligations to notify other parties who may be affected.

If you have any concerns, contact us and we may be able to offer you general advice, or direct you to accredited professionals who can assist with specific issues.

I am a prospective buyer of a site that appears on the list. What should I do?

You should seek advice from the vendor to put the contamination issue into perspective. You may need to seek independent expert advice.

The information provided in the list is meant to be indicative only, and a starting point for your own assessment. Site contamination as a legacy of past site uses is not uncommon,

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

particularly in an urbanised environment. If the contamination on a site is properly remediated or managed, it may not materially impact upon the intended future use of the site. However, each site needs to be considered in context.

List of NSW Contaminated Sites Notified to the EPA

Disclaimer

The EPA has taken all reasonable care to ensure that the information in the list of contaminated sites notified to the EPA (the list) is complete and correct. The EPA does not, however, warrant or represent that the list is free from errors or omissions or that it is exhaustive.

The EPA may, without notice, change any or all of the information in the list at any time.

You should obtain independent advice before you make any decision based on the information in the list.

The list is made available on the understanding that the EPA, its servants and agents, to the extent permitted by law, accept no responsibility for any damage, cost, loss or expense incurred by you as a result of:

1. any information in the list; or
2. any error, omission or misrepresentation in the list; or
3. any malfunction or failure to function of the list;
4. without limiting (2) or (3) above, any delay, failure or error in recording, displaying or updating information.

Site Status	Explanation
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or *Protection of the Environment Operations Act 1997*. Alternatively, the EPA may require information via a notice issued under s77 of the *Contaminated Land Management Act 1997* or issue a Preliminary Investigation Order.
Regulation under CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the *Contaminated Land Management Act 1997* is not required.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997*. A regulatory approach is being finalised.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the *Protection of the Environment Operations Act 1997* (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the *Environmental Planning and Assessment Act 1979* (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the *Protection of the Environment Operations Act 1997* (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the *Environmental Planning and Assessment Act 1979* (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the *Contaminated Land Management Act 1997* (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Suburb	Site Name	Address	Contamination Activity Type	Management Class	Latitude	Longitude
PADSTOW	Caltex Service Station	115 Fairford ROAD	Service Station	Under assessment	-33.9434571	151.0345671
PADSTOW	Selleys / Dulux	1-29 Gow STREET	Unclassified	Under assessment	-33.93904125	151.0381725
PADSTOW	Galvatech	49 Gow STREET	Metal Industry	Contamination currently regulated under POEO Act	-33.93808679	151.0346862
PADSTOW	Exide	55 Bryant STREET	Other Industry	Contamination currently regulated under CLM Act	-33.94265241	151.0378986
PADSTOW	Foseco Australia Pty Ltd	7 Stuart STREET	Chemical Industry	Under assessment	-33.94342957	151.0377316
PADSTOW	Sebel Furniture	Parts 64 and 92 Gow STREET	Other Industry	Regulation under CLM Act not required	-33.93606752	151.0322057
PAGEWOOD	Shell Coles Express Service Station	299 Bunnerong PARADE	Service Station	Under assessment	-33.94071282	151.2285063
PAGEWOOD	Former Email Site	Corner of Page Street and Holloway STREET	Other Industry	Contamination currently regulated under CLM Act	-33.94302462	151.2132036
PAMBULA	Offsite area (roadways) adjacent to United Service Station Pambula (former Shell Self Serve)	Corner Quondola Street and Bullara STREET	Service Station	Under assessment	-36.93104481	149.8746763
PARKES	BP Truckstop	(Newell Highway) 1 Forbes ROAD	Other Petroleum	Under assessment	-33.14309226	148.1710282
PARKES	BP Service Station Telescope (Reliance Petroleum)	339 Clarinda STREET	Service Station	Under assessment	-33.13216152	148.1743239
PARKES	Caltex Service Station	352-360 Clarinda STREET	Service Station	Under assessment	-33.13317454	148.173643
PARKES	BP Service Station (Reliance Petroleum)	46 Clarinda STREET	Service Station	Under assessment	-33.14243539	148.1846227
PARKES	Caltex Service Station	Eugowra ROAD	Service Station	Under assessment	-33.19007031	148.224822
PARKLEA	Caltex Service Station	Old Windsor (north of Miami Street) ROAD	Service Station	Under assessment	-33.72407662	150.9336021
PARRAMATTA	BP Service Station	435 Church STREET	Service Station	Under assessment	-33.80498714	151.0056151
PARRAMATTA	7-Eleven (former Mobil) Service Station	81 Victoria ROAD	Service Station	Under assessment	-33.80919769	151.0142894
PARRAMATTA	Coleman Oval Embankment	Cnr of Pitt STREET and Maquarie STREET	Unclassified	Regulation under CLM Act not required	-33.80441625	150.9954841
PARRAMATTA	Parramatta Park Toilet Block Demolition	The Cresent Toilet Block Parramatta PARK	Unclassified	Regulation under CLM Act not required	-33.81054034	150.9961968
PAUPONG	Former Timber Treatment Plant	Off Paupong ROAD	Other Industry	Regulation under CLM Act not required	-36.57657408	148.6624998
PENDLE HILL	7-Eleven Service Station	217 Wentworth AVENUE	Service Station	Under assessment	-33.8017814	150.9577994
PENDLE HILL	Caltex Service Station	602-606 Great Western HIGHWAY	Service Station	Under assessment	-33.80827518	150.9421511
PENNANT HILLS	Shell Coles Express Pennant Hills West	386 Pennant Hills ROAD	Service Station	Contamination currently regulated under CLM Act	-33.73936462	151.0680237
PENRITH	Caltex Penrith Service Station	153 Coreen AVENUE	Service Station	Under assessment	-33.74287244	150.6927071
PENRITH	Former Mobil Depot	174 Coreen AVENUE	Other Petroleum	Under assessment	-33.74484268	150.6980504
PENRITH	Mirvac Industrial Site	2101 Castlereagh ROAD	Other Industry	Regulation under CLM Act not required	-33.73497514	150.6954097
PENRITH	7-Eleven (former Mobil) Service Station	212-222 Andrews ROAD	Service Station	Under assessment	-33.73059678	150.6952571
PENRITH	7-Eleven Service Station	30 Henry ROAD	Service Station	Under assessment	-33.75408799	150.7045594
PENRITH	Caltex Service Station	Castlereagh Rd Cnr Lugard STREET	Service Station	Under assessment	-33.73426843	150.6933382
PENRITH	Crane Enfield Metals	Castlereagh ROAD	Metal Industry	Contamination currently regulated under CLM Act	-33.73734959	150.696442
PENRITH	BP Express Service Station	Corner Coreen Avenue and Castlereagh ROAD	Service Station	Under assessment	-33.74385498	150.6925743
PENSHURST	7-Eleven Service Station	612 Forest ROAD	Service Station	Under assessment	-33.96153533	151.0793525
PENSHURST	Caltex Service Station	641 King Georges ROAD	Service Station	Under assessment	-33.95985335	151.0891118
PERISHER VALLEY	Perisher Centre Loading Dock	Kosciuszko ROAD	Other Petroleum	Under assessment	-36.40392862	148.4111593
PERISHER VALLEY	Perisher Ski Resort	Kosciuszko ROAD	Other Petroleum	Regulation under CLM Act not required	-36.41106374	148.4005469

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

ATTACHMENT L

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Unexploded Ordnance

- Home
- What is UXO?
- Where is UXO?
- UXO Panel Streams
- News and Updates
- Contacts

Where is Unexploded Ordnance (UXO)?

UXO can be found in most states within Australia. The following links will take you to an interactive map that will allow you to search the locations of known areas of concern.

SELECT STATE > FIND A MAP > SELECT PARCEL

No Results Found

No parcel found for Lot **1** DP/SP **252457**. Only parcels within 500m of a known UXO area are available. Defence is actively engaged in identifying areas where UXO are likely to be present. Members of the public can assist in this process. If you have any information that may be of assistance please contact UXO@defence.gov.au via email.

Back

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

ATTACHMENT M

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Geo-Logix

PASSIVE SOIL GAS SAMPLE LOG

PROJECT INFORMATION	
PROJECT NAME / NUMBER	1601069
INITIALS:	AM
DATE:	19/7/16

SAMPLE INFORMATION	
SAMPLE ID:	SSU1
SAMPLE TYPE:	☐ Sub-slab ☐ Soil Vapour
SAMPLE DEPTH:	0.28
BOREHOLE SEALANT:	Glad-wrap + modelling clay

SAMPLE LOCATION OBSERVATIONS (OUTSIDE CONTAMINANT SOURCES, BOREHOLE ODOURS, ETC)
Next to existing drycleaner. Also where past drycleaner was.

SOIL DESCRIPTION
Mixed in drill cores.
SOIL MOISTURE: ☐ Wet ☐ Moist ☐ Dry

WEATHER	
AVERAGE TEMPERATURE: 20°C	PRECIPITATION: 70% humidity

TIMING		
MINIMUM CALCULATED DEPLOYMENT TIME:		
SAMPLE START TIME:	10:15	SAMPLE START DATE: 19/7/16
SAMPLE RETRIEVAL TIME:	8:45	SAMPLE RETRIEVAL DATE: 21/7/16
TOTAL DEPLOYMENT TIME:	46:30	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Geo-Logix

PASSIVE SOIL GAS SAMPLE LOG

PROJECT INFORMATION	
PROJECT NAME / NUMBER	160169
INITIALS:	AM
DATE:	19/7/16

SAMPLE INFORMATION	
SAMPLE ID:	SSV2
SAMPLE TYPE:	☐ Sub-slab ☐ Soil Vapour
SAMPLE DEPTH:	0.36
BOREHOLE SEALANT:	Glad wrap & modelling clay

SAMPLE LOCATION OBSERVATIONS (OUTSIDE CONTAMINANT SOURCES, BOREHOLE ODOURS, ETC)
NW corner of shop under clothing rack

SOIL DESCRIPTION
Mixed in drill rods
SOIL MOISTURE: ☐ Wet ☐ Moist ☐ Dry

WEATHER	
AVERAGE TEMPERATURE: 20°C	PRECIPITATION: 70% humidity

TIMING		
MINIMUM CALCULATED DEPLOYMENT TIME:		
SAMPLE START TIME:	10:36	SAMPLE START DATE: 19/7/16
SAMPLE RETRIEVAL TIME:	8:50	SAMPLE RETRIEVAL DATE: 21/7/16
TOTAL DEPLOYMENT TIME:	46:14	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Geo-Logix

PASSIVE SOIL GAS SAMPLE LOG

PROJECT INFORMATION	
PROJECT NAME / NUMBER	1601069
INITIALS:	AM
DATE:	19/7/16

SAMPLE INFORMATION	
SAMPLE ID:	Blank
SAMPLE TYPE:	☐ Sub-slab ☐ Soil Vapour
SAMPLE DEPTH:	Backgraund air
BOREHOLE SEALANT:	N/A

SAMPLE LOCATION OBSERVATIONS (OUTSIDE CONTAMINANT SOURCES, BOREHOLE ODOURS, ETC)
Next to the dry cleaing machine.

SOIL DESCRIPTION
N/A
SOIL MOISTURE: ☐ Wet ☐ Moist ☐ Dry

WEATHER	
AVERAGE TEMPERATURE: 20°C	PRECIPITATION: 70% humidity

TIMING		
MINIMUM CALCULATED DEPLOYMENT TIME:		
SAMPLE START TIME:	10:26	SAMPLE START DATE: 19/7/16
SAMPLE RETRIEVAL TIME:	10:30	SAMPLE RETRIEVAL DATE: 19/7/16
TOTAL DEPLOYMENT TIME:	0.04	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

ATTACHMENT N

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Passive Sample Collection

Unit 10 /585 Blackburn Road,
Notting Hill VIC 3168
Ph: (03) 9574 3311
au.samplereceipt.mitcham@sgs.com

SGS

Page 1 of 1

Email address: tgunns@geo-logix.com.au

Project Manager: Tim Gunns
Sampled by: (Print and Sign) Aidan McKenzie
Company Geo-Logix
Address 2309/4 Daydream St
City Warriewood State NSW Post Code 2102
Phone: 02 9979 1722
ABN: 86 116 892 936

Project Info
Purchase Order Number: PO1393
Suburb & State: Penrith, NSW
Project Number: 160169
Project Name: Penrith P1

Turn Around Time
Normal: ✓
Rapid:
(surcharges apply)
Specify: (days)

Lab ID	Field Sample I.D. (Location)	Sampler I.D (WMS Code)	Date of Deployment	Time of Deployment	Date of Retrieval	Time of Retrieval	Analysis Required	Indoor Air	Outdoor Air	Workplace Monitoring	Other ( )
	SSV1	1605-AN-LV-091	19/7/16	10:15	21/7/16	8:45	VOC				
	SSV2	1605-AN-LV-090	↓	10:36	↓	8:50	↓				
	Blank	1605-AN-LV-093	↓	10:26	19/7/16	10:30	↓				

Relinquished By: Name, Signature, Date/Time	Received by: Name, Signature, Date/Time	Air Temp and Weather Description:
Aidan McKenzie 25/7/16	Received by: Name, Signature, Date/Time 25/7/16 9:00am	
Relinquished By: Name, Signature, Date/Time	Received by: Name, Signature, Date/Time	Notes:
Relinquished By: Name, Signature, Date/Time	Received by: Name, Signature, Date/Time	

A.B.N. 44 000 964 278
10 / 585 Blackburn Road
Notting Hill, Vic, 3168
Telephone: (03) 9574 3200

A.B.N. 44 000 964 278

Sample Receipt Acknowledgement

To:	Tim Gunns	From:	Evan Jones
Fax:	02 9979 1222	Pages:	(1) including this page
Co:	Geo-Logix Pty Ltd	Date:	25/07/2016
Email	tgunns@geo-logix.com.au	Ref:	M161503

SGS has received your samples from the project listed below. If you have any enquiries please contact us quoting our reference number.

Project/Reference No.:	1601069
Our Reference Number:	**M161503**
Date Received:	25-Jul-2016
Estimated date of report:	03-Aug-2016

Additional Information:

Samples received after 4 pm are considered as received on the next working day for turnaround purposes.
Samples with a 24hr or 48hr TAT are considered as received on the next working day if received after 2:30pm.
Surcharges for urgent turnaround requests may apply.
All analytical work is conducted at our Melbourne office.
Sample Storage - All aqueous samples are stored for **two weeks** after reporting.
- All soils and other samples are stored for **one month** after reporting.
Please direct any technical or turnaround queries to Adam Atkinson at our Melbourne office.

SGS

Specialist Laboratory Services

To the extent not inconsistent with the other provisions of this document and unless spedifically agreed otherwise in writing by SGS, all SGS services are rendered in accordance with the applicable SGS General Conditions of Service accessible at http://www.sgs.com/en/Terms-and-Conditions/General-Conditions-of-Services-English.aspx as at the date of this document.

Attention is drawn to the limitations of liability and to the clauses of indemnification .

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

A.B.N. 44 000 964 278
10 / 585 Blackburn Road
Notting Hill, Vic, 3168
Telephone: (03) 9574 3200

Chartered Chemists

5-Aug-2016

REPORT NUMBER: M161503
Site/Client Ref: 1601069
Order No: PO1376/PO1393

Geo-Logix Pty Ltd

Building Q2, Level 3
Unit 2309 /4 Daydream Street
Warriewood
New South Wales 2102
Attention: Tim Gunns

CERTIFICATE OF ANALYSIS

SAMPLES:	Three samples were received for analysis
DATE RECEIVED:	**25-Jul-2016**
DATE COMMENCED:	**25-Jul-2016**
METHODS:	See Attached Results
RESULTS:	Please refer to attached pages for results.

Note: Results are based on samples as received at SGS laboratories
Results in airbourne concentrations are calculated using data provided by the client

REPORTED BY:

Adam Atkinson
Business Manager

NATA Accredited Laboratory Number: 14429

Accredited for compliance
with ISO/IEC 17025.

ANALYTICAL RESULTS

Matrix: Passive Sampler
Method: MA-5.WL.04 Volatile Organics
Sample units are expressed in µg/m³

Test Started: 28-Jul-16

Analyte Name	Sampled Date / PQL	Leeder ID: 2016019745 Client ID: SSV1 1605-AN-LU-091 21-Jul-16	Leeder ID: 2016019746 Client ID: SSV2 1605-AN-LU-090 21-Jul-16	Leeder ID: 2016019747 Client ID: Blank 1605-AN-LU-093 19-Jul-16
Benzene		55	<27	<27
2-butanone(MEK)		<51	<52	<52
Carbon tetrachloride		<42	<42	<42
Chlorobenzene		<16	<16	<16
Chloroform		110	<33	<34
12-Dichlorobenzene		<8.4	<8.4	<8.4
13-Dichlorobenzene		<9.6	<9.7	<9.7
14-Dichlorobenzene		<9.4	<9.4	<9.5
1,1-Dichloroethane		<66	<67	<67
12-Dichloroethane		<27	<27	<27
1,1-Dichloroethene		<78	<78	<79
cis-1,2-Dichloroethene		3000	<34	<34
trans-1,2-Dichloroethene		510	<35	<35
Ethylbenzene		<14	<14	<14
Hexane		<35	<35	<35
Isopropylbenzene		<6.9	<6.9	<7.0
Naphthalene		<18	<18	<18
Tetrachloroethene		210000	16000	<16
Toluene		41	<18	<18
111-Trichloroethane		<51	<52	<52
112-Trichloroethane		<20	<20	<20
Trichloroethene		6000	350	<21
124-Trimethylbenzene		<9.8	<9.9	<9.9
Vinyl Chloride		<130	<130	<130
o-Xylene		<15	<15	<15
m&p-Xylenes		24	<15	<15
Dichlorodifluoromethane		<350	<350	<350
Trichlorofluoromethane		<130	<130	<130
124-Trichlorobenzene		<14	<14	<14
123-Trichlorobenzene		<8.4	<8.4	<8.4
Halothane		<120	<120	<120

ANALYTICAL RESULTS

Matrix: Passive Sampler
Method: MA-5.WL.03 Volatile Organics
Sample units are expressed in µg total

Test Started: 28-Jul-16

Analyte Name	Leeder ID / Client ID / Sampled Date / PQL	2016019748 Method Blank
Benzene	0.05	nd
2-butanone(MEK)	0.05	nd
Carbon tetrachloride	0.05	nd
Chlorobenzene	0.05	nd
Chloroform	0.05	nd
12-Dichlorobenzene	0.05	nd
13-Dichlorobenzene	0.05	nd
14-Dichlorobenzene	0.05	nd
1,1-Dichloroethane	0.05	nd
12-Dichloroethane	0.05	nd
1,1-Dichloroethene	0.05	nd
cis-1,2-Dichloroethene	0.05	nd
trans-1,2-Dichloroethene	0.05	nd
Ethylbenzene	0.05	nd
Hexane	0.05	nd
Isopropylbenzene	0.05	nd
Naphthalene	0.05	nd
Tetrachloroethene	0.05	nd
Toluene	0.05	nd
111-Trichloroethane	0.05	nd
112-Trichloroethane	0.05	nd
Trichloroethene	0.05	nd
124-Trimethylbenzene	0.05	nd
Vinyl Chloride	0.05	nd
o-Xylene	0.05	nd
m&p-Xylenes	0.05	nd
Dichlorodifluoromethane	0.05	nd
Trichlorofluoromethane	0.05	nd
124-Trichlorobenzene	0.05	nd
123-Trichlorobenzene	0.05	nd
Halothane	0.05	nd

QA/QC RESULTS

Matrix: Passive Sampler
Method: MA-5.WL.03 Volatile Organics
Quality Control Results are expressed in Percent Recovery of expected result

Test Started: 28-Jul-16

Analyte Name	Leeder ID / Client ID / Sampled Date / PQL	2016019749 Method Spike	2016019750 Method Spike Dup
Benzene		92	95
Chlorobenzene		88	91
12-Dichlorobenzene		89	95
13-Dichlorobenzene		88	96
14-Dichlorobenzene		90	92
Ethylbenzene		93	97
Toluene		92	97
o-Xylene		90	94
m&p-Xylenes		94	96

QUALIFIERS / NOTES FOR REPORTED RESULTS

PQL	Practical Quantitation Limit
nd	Not Detected – The analyte was not detected above the reported PQL.
is	Insufficient Sample to perform this analysis.
T	Tentative identification based on computer library search of mass spectra.
NC	Not calculated and/or Results below PQL
NV	No Vacuum, Canister received above standard atmospheric pressure
nr	Not Requested for analysis.
R	Rejected Result – results for this analysis failed QC checks.
SQ	Semi-Quantitative result – quantitation based on a generic response factor for this class of analyte.
IM	Inappropriate method of analysis for this compound
U	Unable to provide Quality Control data – high levels of compounds in sample interfered with analysis of QC results.
UF	Unable to provide Quality Control data- Surrogates failed QC checks due to sample matrix effects
L	Analyte detected at a level above the linear response of calibration curve.
E	Estimated result. NATA accreditation does not cover estimated results.
C1	These compounds co-elute.
--	Parameter Not Determined
CT	Elevated concentration. Results reported from carbon tube analysis
**	Sample shows non-petroleum hydrocarbon profile

This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at http://www.sgs.com/en/Terms-and-Conditions/General-Conditions-of-Services-English.aspx. The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

APPENDIX ONE.

CHAIN OF CUSTODY DOCUMENT

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Passive Sample Collection

Unit 10 /585 Blackburn Road,
Notting Hill VIC 3168
Ph: (03) 9574 3311
au.samplereceipt.mitcham@sgs.com

SGS

Page 1 of 1

Email address: tgunns@geo-logix.com.au

Project Manager: Tim Gunns
Sampled by: (Print and Sign) Aidan McKenzie
Company Geo-Logix
Address 2309/4 Daydream St
City Warriewood State NSW Post Code 2102
Phone: 02 9979 1722
ABN: 86 116 892 936

Project Info
Purchase Order Number: PO1393
Suburb & State: Penrith, NSW
Project Number: 160169
Project Name: Penrith P1

Turn Around Time
Normal: ✓
Rapid:
(surcharges apply)
Specify: (days)

Lab ID	Field Sample I.D. (Location)	Sampler I.D (WMS Code)	Date of Deployment	Time of Deployment	Date of Retrieval	Time of Retrieval	Analysis Required	Indoor Air	Outdoor Air	Workplace Monitoring	Other ( )
	SSV1	1605-AN-LV-091	19/7/16	10:15	21/7/16	8:45	VOC				
	SSV2	1605-AN-LV-090	↓	10:36	↓	8:50	↓				
	Blank	1605-AN-LV-093	↓	10:26	19/7/16	10:30	↓				

Relinquished By: Name, Signature, Date/Time	Received by: Name, Signature, Date/Time	Air Temp and Weather Description:
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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix E Detailed Site Investigation 2017

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Version: 1, Version Date: 14/04/2021

Penrith City Council

114 to 146 Henry Street, 42-50 Station Street, and Allen Place Carpark Penrith, NSW

Phase 2 Environmental Site Assessment

ϕ July 2017

52152/104051 Rev A

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Penrith City Council

114 to 146 Henry Street, 42-50 Station Street, and Allen Place Carpark Penrith, NSW Phase 2 Environmental Site Assessment

ϕ July 2017

52152/104051 Rev A

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table of Contents

Abbreviations vii

Executive Summary viii

1. Introduction 1
   - 1.1 Introduction 1
   - 1.2 Objectives 1
   - 1.3 Scope of Works 1

2. Site Condition and Surrounding Environment 3
   - 2.1 Site Identification 3
   - 2.2 Site Description 3
   - 2.3 Surrounding Land Use 4
   - 2.4 Topography 4
   - 2.5 Geology and Soils 4
   - 2.6 Hydrology 5
   - 2.7 Hydrogeology 5
   - 2.8 Acid Sulfate Soils 6
   - 2.9 Meteorology 6

3. Site History 7
   - 3.1 Previous Environmental Investigations 7
   - 3.2 Aerial Photographs 7
   - 3.3 EPA Records 8
   - 3.4 Council Section 149 Certificates 9
   - 3.5 Heritage 9
   - 3.6 SafeWork NSW Records 10
   - 3.7 Historical Land Title Records 10
   - 3.8 Integrity Assessment and Summary of Site History 12

4. Conceptual Site Model 13
   - 4.1 Potential Areas of Environmental Concern 13
   - 4.2 Known Contaminated Media 13
   - 4.3 Potentially Contaminated Media 13
   - 4.4 Potential for Migration from Site 14
   - 4.5 Potential Human and Ecological Receptors 14
   - 4.6 Potential and Complete Exposure Pathways 15
   - 4.7 Preferential Pathways 15
   - 4.8 Source to Receptor Pathway Summary 15

5. Sampling and Analysis Plan 17
   - 5.1 Data Quality Objectives 17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5.1.1 State the Problem 17
5.1.2 Identify the Decision 17
5.1.3 Identify Inputs to the Decision 17
5.1.4 Define the Study Boundaries 18
5.1.5 Develop and Decision Rule 18
5.1.6 Specific Limits on Decision Errors 19
5.2 Optimise the Design of Obtaining Data 21
5.2.1 Soil, Groundwater and Soil Vapour Investigation Program 21
5.2.2 Soil Sampling Methodology 21
5.2.3 Groundwater Sampling Methodology 21
5.2.4 Soil Vapour Sampling Methodology 22
5.2.5 Decontamination 23
5.2.6 Duplicate and Triplicate Sample Preparation 23
5.2.7 Laboratory Analysis 23
6. Assessment Criteria 25
6.1 Regulatory Guidelines 25
6.2 Assessment Criteria Selection 25
6.2.1 Groundwater Investigation Levels 26
6.2.2 Derivation of Site Specific Ecological Investigation Levels 26
7. Quality Assurance/Quality Control 28
7.1 QA/QC Results 28
7.2 QA/QC Discussion 29
7.2.1 Precision 29
7.2.2 Accuracy 30
7.2.3 Representativeness 31
7.2.4 Comparability 32
7.2.5 Completeness 32
7.2.6 Sensitivity 32
7.2.7 QA/QC Conclusions 32
8. Results 33
8.1 Soil Observations 33
8.2 Soil Contamination Analytical Results 33
8.2.1 Metals 33
8.2.2 Polycyclic Aromatic Hydrocarbons 34
8.2.3 Total Recoverable Hydrocarbons and BTEX Compounds 34
8.2.4 Organochlorine Pesticides and Polychlorinated Biphenyls 34
8.2.5 Volatile Organic Compounds 34
8.2.6 Asbestos 34

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.3 Groundwater Field Observations 34
8.4 Groundwater Analytical Results 35
8.4.1 Metals 35
8.4.2 Total Recoverable Hydrocarbons and BTEX Compounds 35
8.4.3 Polycyclic Aromatic Hydrocarbons 35
8.4.4 Volatile Organic Compounds 35
8.5 Soil Vapour Contamination Analytical Results 35
8.5.1 Volatile Organic Compounds 35
8.5.2 Total Recoverable Hydrocarbons 36
8.6 Waste Classification 36
9. Discussion 38
9.1 Contaminant Distribution Summary 38
9.2 Potential Risks to Future Onsite Receptors 38
9.3 Background Soil Contamination 39
9.4 Chemical Mixtures 39
9.5 Aesthetic Issues 39
9.6 Potential Migration of Contaminants 39
9.7 Site Management Strategy 39
10. Conclusions & Recommendations 40
11. Limitations 41

List of Tables

Table 2.1 Summary Site Details 3
Table 2.2 Registered Groundwater Bore Search 5
Table 3.1 Summary of Title Searches 10
Table 4.1 Areas of Environmental Concern and Contaminants of Potential Concern 13
Table 4.2 Conceptual Site Model Source to Receptor Summary 16
Table 5.1 Summary of Decision Rules 18
Table 5.2 Data Quality Indicators 20
Table 5.3 Analytical Schedule 24
Table 6.1 Derivation of EILs 27
Table 7.1 QA/QC Results Summary 28
Table 8.1 Groundwater Geospatial Characteristics 34
Table 8.2 Groundwater Field Physicochemical Parameters 34
Table 8.3 Groundwater Field Physicochemical Parameters 35

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

List of Figures

Figure 1 Site Location

Figure 2 Site Layout

Figure 3A Soil Investigation Locations and Site Assessment Criteria Exceedances

Figure 3B Groundwater Monitoring Wells

Figure 3C Soil Vapour Probes and Site Assessment Criteria Exceedances

Appendices

Table A(I): Soil Analytical Results (Health Criteria)

Table A(II): Soil Analytical Results (Ecological Criteria)

Table B(I): Groundwater Analytical Results

Table C(I): Soil Vapour Analytical results

Table D(I): Waste Classification Criteria

Appendix A Geotechnical Investigation

Appendix B Photographic Log

Appendix C Groundwater Well Installation Logs

Appendix D Aerial Photographs

Appendix E EPA Records

Appendix F Council Section 149 (2&5) Certificates

Appendix G Australian and NSW Heritage Data Base Searches

Appendix H SafeWork NSW Records

Appendix I Current & Historical Land Title Records

Appendix J Proposed General Development Scheme

Appendix K Calibration and Decontamination Records

Appendix L Detailed Laboratory Reports and Chain of Custody Documentation

Appendix M Detailed Quality Assurance / Quality Control Documentation

Appendix N Field Borehole Logs

Appendix O Statistical Analyses

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Abbreviations

Term	Definition
°C	Degrees Celsius
ABC	Average Background Concentration
ACL	Added Contaminant Limit
ACM	Asbestos Containing Material
AEC	Area of Environmental Control
AHD	Australian Height Datum
ASS	Acid Sulphate Soils
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
CEC	Cation Exchange Capacity
COC	Chain of Command
COPC	Contaminants of Potential Concern
CSM	Conceptual Site Model
DBYD	Dial Before You Dig
DEC	Department of Environment and Conservation
DMR	Department of Mineral Resources
DOH	Department of Health
DP	Deposited Plan
DPI	Department of Primary Industries
DQI	Data Quality Indicators
DQO	Data Quality Objectives
DSI	Detailed Site Assessment
EIL	Ecological Investigation Levels
EPA	Environmental Protection Authority
ESA	Environmental Site Assessment
ESL	Ecological Screening Level
HBM	Hazardous Building Material
HIL	Health Investigation Level
HSL	Health Screening Level
JBS&G	JBS&G Australian Pty Ltd
LCS	Laboratory Control Sample
LOR	Limit of Reporting
MGA	Map Grid of Australia
NSW	New South Wales
OCP	Organochlorine Pesticide
OPP	Organophosphorus Pesticide
PAH	Polycyclic Aromatic Hydrocarbon
PARCCS	Precision, Accuracy, Representativeness, Comparability, Completeness, Sensitivity
PCB	Polychlorinated Biphenyls
PSI	Preliminary Site Assessment
QA/QC	Quality Assurance / Quality Control
RfP	Request for Proposal
RPD	Relative Percentage Difference
TEQ	Toxic Equivalence Quotient
TRH / TPH	Total Recoverable Hydrocarbons / Total Petroleum Hydrocarbon
UCL	Upper Confidence Limit
VOC	Volatile Organic Compound

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Executive Summary

JBS&G Australia Pty Ltd (JBS&G) was engaged by Penrith City Council (Council, the client) to provide environmental consulting services associated with the Combined Phase 1 and 2 Environmental Site Assessment (ESA) in conjunction with the delivery of a Geotechnical Investigation of ten lots located at 114 to 146 Henry Street, 42 to 50 Station Street and Allen Place carpark, Penrith, NSW (the Site). This ESA Report details the findings of the Phase 2 ESA. The legal identification of the lots and part lots which comprise the Site are provided in **Table 2.1**, which comprise a total area of approximately 1.87 hectares (ha) as shown in **Figure 1** and **2**.

It is understood that Council intends on redeveloping the Site for mixed use including recreational space and 4 to 6 storey residential apartments with retail and commercial uses. Council requires an ESA and Geotechnical Investigation to enable the potential contamination and geotechnical risks to be assessed prior to land purchase given the proposed redevelopment.

Penrith engaged Geo-Logix Pty Ltd (Geo-Logix) to conduct a preliminary ESA, Geo-Logix (2016[1]) at the property located at 134-138 Henry Street, Penrith, NSW (the preliminary assessment area, Lot 1 DP164798, **Figure 2**). The preliminary assessment was undertaken to assess the potential for contamination to exist at the site given the presence of an operational dry cleaning business within the preliminary assessment area. Geo-Logix carried out passive soil vapour assessments at two locations within the dry-cleaning shop. Chlorinated hydrocarbons were detected in soil vapour samples at concentrations in excess of the commercial land use criteria adopted for the assessment.

Sample results from the soil vapour sampling and analyses undertake as part of this investigation have indicated that there currently exists a significant chlorinated hydrocarbon impact within the vicinity of the dry cleaner. The volatile gas impact extends north of the dry cleaner, along the inferred groundwater flow direction, with exceedances of the soil vapour criteria for PCE and TCE identified from gas samples taken at probe locations SV04, SV05 and SV10 (**Figure 3C**). It is noted that the most significant concentrations were detected at location SV05, approximately in line with the inferred groundwater flow direction.

The presence of chlorinated hydrocarbons in soil vapour represent a potential risk to current and future site users and will require remediation/management for the proposed land uses. The concentration of PCE within soil vapour at location SV05 and the concentration of both PCE and TCE exceeded the adopted HIL-C criteria; these exceedances represent a risk to future onsite receptors.

Concentrations of COPC in all other samples analysed were reported to be at concentrations which did not indicate the presence of statistically significant exceedances of the adopted site assessment criteria.

Groundwater and soil concentrations within the vicinity of the dry cleaner have also indicated the presence of chlorinated hydrocarbons, primarily PCE and TCE, albeit at concentrations which were below the adopted site assessment criteria. This has indicated that the impact has migrated laterally and vertically through soil and groundwater at the Site. It is noted that no well downstream of the impact was able to be installed due to the presence of building awnings/eaves along the northern boundary of the Site. It is considered possible that additional groundwater impact may be present at the Site that has yet to be identified.

Given the Site history, the presence of buried anthropogenic materials in the form of building and demolition waste and the identification of trace levels of asbestos within soil at location JB11, it is considered likely that ACM is present at other locations at the Site. Boreholes are limited in their

[1] *'Preliminary Environmental Site Assessment Report, 134 – 138 Henry Street Penrith NSW 2750'*, Geo-Logix Pty Ltd, Reference: 1601069Rpt01FinalV01_12Aug16, 12 August 2016, Geo-Logix (2016)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

utility for the identification of buried asbestos and ACM, therefore redevelopment of the Site may uncover additional, undocumented asbestos which could potentially represent a risk to human health.

In accordance with the limitations in **Section 11**, the following conclusions are provided:

- Soil vapour concentrations within the vicinity of the dry cleaner represent a potential risk to current and future site users which will require management prior to utilisation of the Site for the proposed land uses;
- Offsite migration of chlorinated hydrocarbons is potentially occurring, north of the dry cleaner along the inferred groundwater flow direction;
- Lead impacted fill material in the vicinity of JHA02 is required to be managed prior to the utilisation of the site for the proposed land uses;
- Asbestos and ACM may be present within surficial fill materials at the Site which has not been documented as part of this DSI. Boreholes are limited in their utility for the identification of buried asbestos and ACM. During the redevelopment stage of the works, additional asbestos may be identified which could potentially represent a risk to human health and will require management/remediation during redevelopment;
- Contaminants in soils and groundwater were generally not present at concentrations representing statistically significant exceedances of the Site assessment criteria, and therefore with the exception of the aforementioned, do not represent a risk to the current or futures site users;
- No background soil concentrations or aesthetic issues were identified in this assessment;
- The Site is currently unsuitable for the proposed land uses. Subject to the implementation of an RAP which manages the identified impacts, it is considered that the Site can be made suitable for the proposed land uses; and
- The reported concentrations of chlorinated hydrocarbons in groundwater/soil vapour exceed the relevant investigation levels presented in Schedule B1 of the *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPC 2013). As a result, there is a potential requirement for the site to be notified to the NSW EPA in accordance with the *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* (NSW EPA 2015).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1. Introduction

1.1 Introduction

JBS&G Australia Pty Ltd (JBS&G) was engaged by Penrith City Council (Council, the client) to provide environmental consulting services associated with the Combined Phase 1 and 2 Environmental Site Assessment (ESA) in conjunction with the delivery of a Geotechnical Investigation of ten lots located at 114 to 146 Henry Street, 42 to 50 Station Street and Allen Place carpark, Penrith, NSW (the Site). This ESA Report details the findings of the Phase 2 ESA. The legal identification of the lots and part lots which comprise the Site are provided in **Table 2.1**, which comprise a total area of approximately 1.87 hectares (ha) as shown in **Figure 1** and **2**.

The Site is located within a suburban setting comprising a sealed, asphaltic pavement carpark with several pedestrian and vehicular access roads, bordered by a combination of wooden guard rails, planter boxes and vegetation. The majority of the Site was an active carpark at the time of the investigation.

It is understood that Council intends on redeveloping the Site for mixed use including recreational space and 4 to 6 storey residential apartments with retail and commercial uses. Council requires an ESA and Geotechnical Investigation to enable the potential contamination and geotechnical risks to be assessed prior to land purchase given the proposed redevelopment.

This report has been developed in accordance with guidelines made or approved by the NSW Environment Protection Authority (EPA) and relevant Australian Standards. The Geotechnical component of the assessment was completed by Pells Sullivan Meynink (PSM) and was carried out concurrently with the environmental investigation. The PSM report is included as **Appendix A**.

1.2 Objectives

The objectives of the investigation were to assess the potential for contamination based on current and historical Site activities and to draw conclusions regarding the potential contamination status of the Site for the proposed land uses, or make recommendations to enable such conclusions to be made.

1.3 Scope of Works

The agreed scope of works completed for this assessment comprised:

- A review of available Site history and background information to identify potential areas of environmental concern (AECs) and associated contaminants of potential concern (COPC), including:
    - Section 149(2&5) certificates obtained from council from three representative lots;
    - Records of stored Dangerous Goods held by WorkCover;
    - Historical aerial photographs obtained from the Department of Lands;
    - Publicly available heritage records held by the Department of Planning and Environment and Council, where readily available;
    - Records of environmental incidents, former environmental licences, or contaminated land notices or notifications, as held by the EPA; and
    - Licensed groundwater bores present within a 1.5 km radius of the Site available on the online NSW Natural Resources Atlas.
- Review of the environmental setting including a review of topography, geology, hydrogeology and meteorology of the Site and surrounding areas;
- A detailed Site inspection to identify potential AECs and confirm desktop findings;

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Development and documentation of a conceptual site model (CSM) based on the available information;
- Development and documentation of the data quality objectives (DQOs) for the ESA in general accordance with relevant EPA guidelines;
- Implementation of a Detailed Site Investigation (DSI) program including advancement of systematic and targeted soil, soil vapour and groundwater sampling locations;
- Analysis of selected samples for a range of COPCs as identified during the Preliminary Site Investigation (PSI) component of the investigations;
- Comparison of collected data against regulator published / endorsed investigation criteria to facilitate an assessment of land use suitability;
- Comparison of collected data against guidelines of for classifying waste (EPA 2014[2]); and
- Preparation of an ESA report in general accordance with relevant EPA guidelines.

[2] *'Waste Classification Guidelines – Part 1: Classifying Waste'*, Environmental Protection Authority, November 2014 (EPA 2014)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2. Site Condition and Surrounding Environment

2.1 Site Identification

The Site location is shown on **Figure 1**. The extent of the Site and associated cadastral boundaries are shown on **Figure 2**. The Site details are summarised in **Table 2.1** and described in detail in the following sections.

Table 2.1 Summary Site Details

Lots / DPs	Lot 1 in DP526304, DP163176 (No Lot #), Lot 2 in DP556075, Lot 10 in DP553665, Lot 11 in DP 553665, Lot 1 in DP164798, Lot 1 in DP545587, Lot 1 in DP254763, Lot 3 in DP1200790, Lot 1 in DP113118 and Allen Place Carpark
Address	114-146 Henry Street, 42-50 Station Street and Allen Place Car Park, Penrith NSW
Local Government Authority	Penrith City Council
Approximate MGA Coordinates (MGA 56)	As shown on **Figure 2**
Site Zoning	Commercial Core (B3) and Public Recreation (RE1) (Penrith 2010[3])
Current Use	Commercial and car parking
Previous Use	Commercial and car parking
Proposed Use	Mixed Use – Recreation, high density residential and commercial
Site Area	Approximately 1.87 ha

2.2 Site Description

A detailed site inspection was completed by Rohan Hammond on 31 October 2016 and again on 26 May 2017, relevant details are documented below. A photographic log is presented in **Appendix B**.

The Site comprised an approximately rectangular, large commercial car park in the centre of the Allen Place loop road and ten commercial premises on the southern side of Henry Street in Penrith. The borders of the Site were not secured and open to the public (pedestrians and vehicles) with the exception.

The Site topography did not appear to have been significantly altered from their natural alignment, comprising a slightly raised eastern section which sloped gradually downward toward the west.

The Site comprised a mixture of commercial uses at the time of the site investigation: an operational car park, dry cleaner, retail shops and cafes. High pedestrian and vehicular traffic was observed during working hours. At the beginning of the investigation (31 October 2016), a vehicular overbridge existed which was observed to link traffic from the central portion of the Allen Place Car Park to rooftop car parking on the adjacent side of Station Street, west of the Site. Throughout the course of the investigation, prior to any soil environmental sampling activities, the overbridge was demolished and ground surface reinstated by asphaltic pavements.

Approximately 95 % of the Site comprised sealed ground in the form of asphaltic pavement, concrete pathways, and building footprints with onsite drainage channels directing surface water toward the municipal stormwater system. The balance of the Site comprised unsealed grounds in the form of garden beds and unpaved areas.

Buildings at the Site have generally not been maintained to a high level of repair although no significant degradation of building materials was observed. A detailed inspection/hazardous building materials survey of the existing site structures was not undertaken as part of this investigation.

No surface water was present at the Site at the time of the investigation. No evidence of waste storage or storage tanks was observed at the Site. North of the dry cleaner, olfactory indicators of volatile chemical usage were noted. No visual indicators of gross or widespread contamination were observed. Four transformers were observed: one in the southwest and east corners of the Site and

[3] *'Penrith Local Environmental Plan 2010'*, Penrith City Council, Published 11 March 2016, Penrith 2010

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

two along the northern boundary of the Allen Place Car Park, which were on raised concrete platforms. No hydrocarbon staining was observed to be associated with the transformers..

2.3 Surrounding Land Use

The current land uses of adjacent properties or properties across adjacent roads are summarised below.

- North – The Site is bound to the north by Henry Street and then numerous commercial premises including Fit n Fast Penrith, Queens of Hearts Community Foundation and Nepean College. Further north was an open carpark and commercial premises on Belmore Street, including Bob Jane T-Marts and Veterinary Hospital;
- East – To the east of the Site is Woodriff Street North, with commercial premises and Edwards Place carpark. Further east were a Pathology Centre and testing laboratory;
- South – The Site is bound to the south by Allen Place, following which are multiple commercial properties including cafes, a medical centre and pharmacy. Further south commercial premises are present beyond High Street; and
- West – The Site is bound to the west by Station Street, then medium to high density commercial premises. Further to the west was Peach Tree Creek and eventually the Nepean River.

2.4 Topography

Review of topographic information obtained from the Spatial Information Exchange Viewer (LPI 2015[4]) regional topographic map indicated that site has an elevation of approximately 30 m Australian Height Datum (AHD) sloping generally downwards to the west. Regional topography sloped down to the west towards the Nepean River.

Site inspection confirmed that the topography on site was not significantly altered from the natural alignment and sloped slightly downward toward Station Street, west of the Site. Localised variations in ground level were associated with cut to fill works for the construction of planted garden beds.

2.5 Geology and Soils

Reference to the 1:100 000 Geological Series Sheet for Penrith (DMR 1991[5]) indicates that the Site lays within an area identified to be underlain by Bringelly Shale Ashfield Shale of the Wianamatta Group. The geology originated in the Middle Triassic period of the Mesozoic Era, and is largely characterised by dark-grey to black claystone-siltstone and fine sandstone-siltstone laminate.

Reference to the 1:100 000 Soil Landscape Series Sheet for Penrith (DMR 1990[6]) indicates that the Site is within the Richmond Soil Landscape group. This group of landscape is characterised by quaternary terraces of the Nepean and Georges Rivers. Relatively flat (slopes <1 %) and level. Splays, levees provide local relief of <3 m. Formerly a low open woodland. Richmond soils are poorly structured orange to red clay loams, clays and sands. Texture may increase with depth. Ironstone nodules may be present. Plastic clays in drainage lines, red earths and red podzolic soils occur on terrace surfaces with earthy sands on terrace edges. Limitations of the Richmond group include high erosion hazard on terrace edges and minor localised flooding.

The lithology observed during groundwater well installation (**Appendix C**) reported a moderately deep alluvial soil setting (Clay to sandy clay present from a depth of 0.4 m to 10.5 m below ground surface (bgs)), followed by Nepean River gravels (6.1 m to 13.0 m bgs). The river gravels were, in turn, underlain by grey and black residual shale bedrock.

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4 *'Spatial Information Exchange Viewer'*, NSW Land and Property Information, Accessed 15 July 2016, https://maps.six.nsw.gov.au/

5 *Penrith 1:100 000 Geological Series Sheet 9030 (Edition 1).* Department of Mineral Resources, 1991 (DMR 1991)

6 *Penrith 1:100 000 Soil Landscape Series Sheet 9030.* Department of Mineral Resources, 1990 (DMR 1990)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2.6 Hydrology

Rainfall is considered likely to migrate from site primarily through surface water runoff into the municipal stormwater system. Minor infiltration into the underlying porous soils and surface is also expected in areas of unsealed ground.

As discussed in **Section 2.2**, the Site is largely covered by concrete, asphaltic pavements and building footprints. As such, surface water generated during periods of rainfall is anticipated to primarily enter the municipal stormwater system; via discharge into onsite stormwater catchment infrastructure or alternatively discharge into stormwater pits within the surrounding roadways.

The nearest water body to the Site is Peach Tree Creek, approximately 1.1 km to the west of the Site boundary. Peach Tree Creek ultimately contributes to the Nepean River. Municipal stormwater discharges to the Nepean River.

2.7 Hydrogeology

Registered groundwater bore information was obtained from the NSW Department of Primary Industries groundwater mapping tools (NSW DPI 2016[7]) (**Appendix C**). A review of the registered bore information indicated that there were thirteen bores within a 1.5 km radius of the Site. The registered bore searches are summarised in **Table 2.2**.

Table 2.2 Registered Groundwater Bore Search

Bore ID	Use	Property	Standing Water Level (m bgs)	Well Depth (m)	Encountered Geology Comments
GW026231	Recreation	N/A	-	8.53	Shallow silt and loam clay (4.26 m bgs) to river gravels (4.26-8.53 m bgs)
GW029710	Domestic	N/A	6.00	7.92	Shallow loam (0-2.74 m bgs) to river gravels (2.74-7.92 m bgs)
GW101178	Test Bore	N/A	8.00	11.20	Shallow sandy clay and grey sands (0-6.00 m bgs) to coarse river gravel and cobbles (6.00-10.50 m bgs) overlying residual shale.
GW103048	Recreation	Penrith Showground	6.00	8.00	-
GW108041	Monitoring	Coreen Ave Penrith	6.70	7.50	Shallow clay (0.20-3.30 m bgs) overlying river gravels (3.30-7.50 m bgs)
GW108042	Monitoring	Coreen Ave Penrith	6.40	8.00	Shallow clay (0.20-2.50 m bgs) overlying river gravels (2.50-7.50 m bgs)
GW108043	Monitoring	Coreen Ave Penrith	6.80	9.00	Shallow clayey sands (0.20-5.40 m bgs) overlying river ravels (5.40-9.00 m bgs)
GW108044	Monitoring	Coreen Ave Penrith	6.60	9.50	Shallow fill and silty clayey sands (0.00-6.40 m bgs) overlying river gravels (6.40-9.50 m bgs)
GW108484	Recreation	Station St Penrith	-	11.00	Shallow clay (0-6.00 m bgs) to sand (6.00-8.50 mbgs) overlying river gravels (8.50-11.00 m bgs)
GW111987	Monitoring	High St Penrith	-	9.00	Shallow clay (0-3.00 m bgs) overlying river gravels (3.00-9.00 m bgs)
GW111988	Monitoring	High St Penrith	7.50	9.00	Shallow clay (0-3.00 m bgs) overlying river gravels (3.00-9.00 m bgs)
GW111989	Monitoring	High St Penrith	7.50	9.00	Shallow clay (0-3.00 m bgs) overlying river gravels (3.00-9.00 m bgs)

Based on the reported geology, topography and depth to groundwater, groundwater migration is expected to occur in a north-westerly direction, towards Peach Tree Creek approximately 1.2 km away. Groundwater has been reported in the surrounding properties within the river gravels layer.

[7] NSW Department of Primary Industries, 2015. Groundwater Monitoring Overview Map. Http://allwaterdata.water.nsw.gov.au/water.stm. Accessed 8 November 2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

A relatively high water table (between 5 and 10 m bgs) is anticipated given the reported levels in the surrounding groundwater wells and the lack of significant variation in topographic levels.

Registered groundwater bores located within a 1.5 km radius of the Site are used for monitoring, recreational and testing purposes. Given the relatively dense urban use of the Site and surrounding properties, in addition to the identified licensed bores, there is considered to be a moderate probability of additional undocumented monitoring/irrigation bores in the vicinity of the Site. No reported utilisation of groundwater as a drinking water source has been reported.

2.8 Acid Sulfate Soils

Review of the Acid Sulfate Soil Risk Map from Australian Soil Resource Information System (ASRIS)[8] indicates that the Site is located within an area of 'low probability of occurrence of Acid Sulfate Soils'. Acid sulfate soils (ASS) are unlikely to be expected to occur in areas having this classification. This is consistent with the topographic and geological setting of the Site.

Three representative Section 149(2&5) council certificates were obtained for the Site as discussed in **Section 3.2**. The land was not identified to have redevelopment restrictions based on the likelihood of the presence of Acid Sulfate Soils.

No indicators of PASS or ASS were observed during intrusive soil investigation. On this basis, there are no further requirements for the assessment or management of ASS as part of this investigation.

2.9 Meteorology

A review of average climatic data for the nearest Bureau of Meteorology monitoring location (Penrith Lakes[9]) indicates the Site is located within the following meteorological setting:

- Average minimum temperatures vary from 5.5 ^{o}C in July to 18.5 ^{o}C in January;
- Average maximum temperatures vary from 17.7 ^{o}C in July to 30.7 ^{o}C in January;
- The average annual rainfall is approximately 728.1 mm with rainfall greater than 1 mm occurring on an average of 71.7 days per year; and
- Monthly rainfall varies from 30.6 mm in September to 121.4 mm in June with the wettest periods occurring on average in January to June.

[8] *Australian Soil Resource Information System,* http://www.asris.csiro.au/, accessed 8 November 2016 (ASRIS)

[9] http://www.bom.gov.au/climate/averages/tables/cw_067113.shtml, Commonwealth of Australia, 2013 Bureau of Meteorology, Product IDCJCM0028 prepared on 1 November 2016 and accessed by JBS&G on 8 November 2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3. Site History

3.1 Previous Environmental Investigations

Penrith engaged Geo-Logix Pty Ltd (Geo-Logix) to conduct a preliminary ESA, Geo-Logix (2016[10]) at the property located at 134-138 Henry Street, Penrith, NSW (the preliminary assessment area, Lot 1 DP164798, **Figure 2**). The preliminary assessment was undertaken to assess the potential for contamination to exist at the site given the presence of an operational dry cleaning business within the preliminary assessment area.

The preliminary ESA identified that the site appeared to be vacant until the 1950s where it was subsequently utilised for material storage. The building layout as observed in the current investigation was constructed during the 1960s and the dry cleaner has operated since 1977. Additionally, aerial photographs provided as part of the report indicated that a service station operated from the 1950s to the 1970s (118 Henry Street, Lot 1 DP113118, **Figure 2**) which may constitute an off-site contamination source for the preliminary assessment area. It is noted that the historical service station area forms part of the current investigation area.

Geo-Logix carried out passive soil vapour assessments at two locations within the dry-cleaning shop. Chlorinated hydrocarbons (tetrachloroethene (PCE), trichloroethene (TCE) and cis-1.2 dichloroethene (DCE)) were detected in soil vapour samples at concentrations in excess of the commercial land use criteria adopted for the assessment. Additionally, benzene, toluene, ethylbenzene and xylene (BTEX) compounds were detected within the soil vapour at concentrations above the laboratory limit of reporting (LOR) but below the commercial land use criteria. Geo-Logix did not identify onsite migration of contaminants from the former service station as a likely source for these BTEX compounds.

The preliminary ESA report identified the presence of potential asbestos containing materials (ACM) forming part of the construction of buildings within the assessment area.

3.2 Aerial Photographs

Copies of aerial photographs obtained from the Department of Land and Property Information are included in **Appendix D**. Relevant information from the aerial photograph review is summarised below.

- **1943**: The Site appeared to comprise a number of residential allotments with defined approximately rectangular boundaries discernible. The central carpark area appeared to have previously been divided into individual properties. Although the image quality is poor, residential style structures were apparent on most of the Site area with the exception of the central northern portion, which was vacant. Immediately surrounding the Site, the High Street, Woodriff Street North, Henry Street and Station Street alignments were observed.

  The surrounding site area was primarily cleared and partially developed allotments comprising several residential and commercial style structures within the immediate vicinity of the Site. The quality of the aerial photograph precluded a detailed assessment of the Site or the surrounding areas.

- **1956**: Several of the previously (1943) unoccupied properties appeared to have been developed, with residential type structures observed on most properties.

  Since the previous aerial photograph (1943), the surrounding site area underwent significant development in the form of construction of residential and commercial structures. Large structures were observed south and north of the Site which were not present in the 1943

[10] *'Preliminary Environmental Site Assessment Report, 134 – 138 Henry Street Penrith NSW 2750'*, Geo-Logix Pty Ltd, Reference: 1601069Rpt01FinalV01_12Aug16, 12 August 2016, Geo-Logix (2016)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Aerial photograph, and many of the surrounding premises had undergone alterations to the built form.

- **1965**: The central portion of the Site was cleared and redeveloped into the Allen Place Car Park, largely as it appeared in the recent site inspection (26 May 2017). The properties on the northern boundary of the Site, abutting Henry Street, had all been demolished and reconstructed, except for 140-142 Henry Street. The dry cleaner (134-138 Henry Street) and structures along Station Street appeared to have been developed into their current form. The eastern section of the northern portion of the Site was occupied by a service station.

  The greater surrounding area appeared to have undergone significant residential and commercial redevelopment since the previous (1956) aerial photograph. Large commercial structures dominated the surrounding street frontage within this aerial photograph. Additionally, the extension of Henry Street was observed to the west of the Site.

- **1978**: Site structures were largely the same as the form observed during the Site inspection, except for the presence of the vehicular overbridge on the southern boundary. Properties at 114-116 and 140-142 Henry Street had been demolished and redeveloped between this and the previous (1965) aerial photograph, with development at 114-116 Henry Street unfinished in this photograph.

  Major redevelopment had continued to the west and east of the site comprising erection of large commercial premises and continued transformation of previously undeveloped land into car parks / commercial shop fronts.

- **1986**: The Site and surrounding area appeared to be consistent with the previous (1978) aerial photograph. Construction of the structure at 114-116 Henry Street had been completed since the previous aerial photograph. Minor additions/alterations to the built form of surrounding properties had occurred and some new structures were present.

- **1994**: The Site appeared largely the same as in the previous (1986) aerial photograph with the exception of additional vegetation in the garden areas. Two large buildings to the north and northwest of the Site had been constructed since the previous aerial photograph.

- **2005 - 2016**: The Site appeared similar to the previous aerial (1994) photograph. Large buildings continued to be erected within the surrounding area, comprising significant structures to the north, northwest and south of the Site.

3.3 EPA Records

Search of the NSW EPA database was undertaken on 8 November 2016 (**Appendix E**) for the Site and immediate surroundings. The search consisted of the:

- NSW EPA Protection of the Environment Act public register of licence, applications and notices (maintained under Section 308 of the *Protection of the Environment Operations Act 1997* (POEO Act));
- NSW EPA contaminated land public register of record of notices (under Section 58 of the *Contaminated Land Management Act 1997* (CLM Act)); and
- NSW contaminated sites notified to the EPA (under Section 60 of the CLM Act).

No prevention, clean-up or prohibitions notices and no transfer, variation, suspension, surrender or revocation of an environment protection licences has been issued under the POEO Act for the Site and immediate surroundings.

No notices have been issued under the CLM Act for the Site and immediate surroundings.

The Site and immediate surroundings are not on the list of NSW contaminated sites notified to the EPA.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.4 Council Section 149 Certificates

A copy of the s149 Planning Certificates for three representative lots (Lot 1 DP 113118, Lot 3 DP1200790 and Lot 10 DP553665) were obtained from Penrith City Council on 10 November 2016 and previous ESA provided by the client has also included s149 Planning Certificates for two additional lots (Lot 1 DP252457 and Lot 1 DP 164798). Relevant details are summarised below and copies of s149 Planning Certificates are included in **Appendix F.**

Given the proximity of the properties, the general similarity of historical uses and environmental setting and the absence of heritage listing within the area, it is reasonable to assume that the section 149 certificates attained for the five lots are representative of all the properties within the Site.

- The land is subject to the requirements under the Penrith City Council Local Environmental Plan 2010;
- The land is currently zoned B3 Commercial Core or B4 Mixed Use (under the provisions of the Planning Proposal for the Penrith City Park) with the exception of Lot 3 DP 1200790 was zoned RE1 Public Recreation;
- The land does not comprise critical habitat;
- The land is not identified to be situated within a Conservation Area and is not identified as containing an item of environmental heritage significance;
- The land is not affected by the Coastal Protection code under the Coastal Protection Act 1979;
- The land is not affected by Section 15 of the Mine Subsidence Compensation Act 1961 proclaiming land to be a Mine Subsidence District.
- The land is not affected by any road widening or road realignment under Division 2 of Part 3 of the Roads Act, Penrith Local Environmental Plan 2010 or an environmental planning instrument;
- The land is not within an investigation area or remediation site under Part 3 of the Contaminated Land Management Act 1997;
- The land is not subject to an investigation order or remediation order within the meaning of the Contaminated Land Management Act 1997;
- The land is not subject to a voluntary investigation proposal (or voluntary remediation proposal) that is the subject of the Environment Protection Authority's agreement under section 15 or 26 of the Contaminated Land Management Act 1997;
- The land is not the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997; and
- All or part of the land is identified in Penrith LEP Clause 7.2 for Flood Planning. Development consent is required of any development on the land to which Clause 7.2 of the LEP applies.

3.5 Heritage

A search of the Australian Heritage Trust database did not reveal any heritage listed items at the Site or its immediate surrounds. Heritage information covers Aboriginal as well as European heritage.

A search of the NSW Heritage Inventory did not reveal any heritage listed items at the Site or immediate surrounds. Both Australian Heritage Trust and NSW Heritage information are included in **Appendix G**.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.6 SafeWork NSW Records

An application to search for licences for stored dangerous goods was submitted to SafeWork NSW on 10 November 2016. The report issued by SafeWork NSW is provided in **Appendix H.** No **d**angerous goods were identified to have been stored at the site. SafeWork NSW identified current storage of dangerous goods at an offsite address (117 Henry Street, Penrith) and has provided details pertaining to this licence. This is considered irrelevant to the current investigation.

3.7 Historical Land Title Records

Historical land title records from three separate lots have been summarised in **Table 3.1.** Detailed title search information is provided in **Appendix I**.

Table 3.1 Summary of Title Searches

Date of Acquisition and Term Held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and Sale
Pertaining to Lot 10 in DP553665		
1.6.1881 (1881 to 1925)	Francis Henry Woodriff (Gentleman)	Book 222 No. 132
5.8.1925 (1925 to 1935)	John Jurry Allen (Farmer)	Book 1396 No. 195
23.2.1935 (1935 to 1948)	Alfred Charles Kemp (Orchardist)	Book 1711 No. 475
14.12.1948 (1948 to 1971)	Roy William Handley (Radio and Electrical Distributor)	Book 2075 No. 355
24.5.1971 (1971 to 1977)	Peter Shaw and Associates Pty Limited	Book 3011 No. 751 Now Vol 12193 Fol 76
1.9.1977 (1977 to 1981)	A.F.Q. Pty Limited	Vol 12193 Fol 76
September 1981 (1981 to 1985)	Gwynvill Properties Pty Limited	Vol 12193 Fol 76
29.4.1985 (1985 to Date)	# Penrith City Council	Vol 12193 Fol 76 Now 10/553665
Pertaining to Lot 3 in DP1200790		
1.6.1881 (1881 to 1927)	Francis Henry Woodriff (Gentleman)	Book 222 No. 132
23.6.1927 & 22.12.1927 (1927 to 1949)	Nelson Price (Undertaker)	Book 1476 No. 306 & Book 1498 No. 679
15.9.1949 (1949 to 1950)	Rural Bank of New South Wales	Book 2098 No. 394
11.5.1950 (1950 to 1973)	William Frederick Smith (Hire Car Proprietor)	Book 2125 No. 665
7.2.1973 (1973 to 2013)	G.B. & H. Lynch Pty Limited Now G.B. & J.A. Lynch Pty Limited	Book 3084 No. 154 Now C/158845
23.9.2013 (2013 to Date)	# Penrith City Council	C/158845 Now 3/1200790
Pertaining to Lot 1 in DP 113118		
No. 1 & 1A		

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Date of Acquisition and Term Held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and Sale
21.6.1881 (1881 to 1936)	Francis Henry Woodriff (Gentleman)	Book 222 No. 132
18.4.1936 (1936 to 1939)	Emily Doolan (Married Woman)	Book 1747 No. 31
20.5.1939 (1939 to 1949)	Mabel Sarah Victoria Kemp (Married Woman)	Book 1846 No. 686
10.9.1940 (1949 to 1967)	Geoffrey Howard Upton (Sports Store Proprietor)	Book 2098 No. 958
1959	The part that we have numbered 1A on the attached cadastral became Council Public Road upon the approval of D.P. 164798, circa 1959 This road was subsequently closed The first title to issue after the road closure is Volume 13759 Folio 102 dated 20.12.1978, issuing in the name of Allen Holdings (Australia) Pty Limited	
6.3.1967 (1967 to 1973)	George Alwyn Power (Garage Proprietor)	Book 2839 No. 396
28.2.1973 (1973 to 1977)	Galvina Pty Limited	Book 3084 No. 905
21.7.1977 (1977 to 1980)	Altco Holdings Pty Limited Then Allen Holdings Pty Limited Now Allen Holdings (Australia) Pty Limited	Book 3284 No. 90 Now Vol 13820 Fol 105
No. 2 & 2A		
21.6.1881 (1881 to 1947)	Francis Henry Woodriff (Gentleman)	Book 222 No. 132
27.3.1947 (1947 to 1967)	Geoffrey Howard Upton (Boot Repairer)	Book 2025 No. 280
1959	The part that we have numbered 1A on the attached cadastral became Council Public Road upon the approval of D.P. 164798, circa 1959 This road was subsequently closed The first title to issue after the road closure is Volume 13759 Folio 102 dated 20.12.1978, issuing in the name of Allen Holdings (Australia) Pty Limited	
6.3.1967 (1967 to 1973)	George Alwyn Power (Garage Proprietor)	Book 2839 No. 396
28.2.1973 (1973 to 1977)	Galvina Pty Limited	Book 3084 No. 905
21.7.1977 (1977 to 1980)	Altco Holdings Pty Limited Then Allen Holdings Pty Limited Now Allen Holdings (Australia) Pty Limited	Book 3284 No. 90 Now Vol 13820 Fol 105
No. 3 & 3A		
21.6.1881 (1881 to 1947)	Francis Henry Woodriff (Gentleman)	Book 222 No. 132
27.3.1947 (1947 to 1947	Charles William Owen Roberts (Electrician)	Book 2032 No. 575
9.10.1947 (1947 to 1967)	Geoffrey Howard Upton (Boot Repairer)	Book 2033 No. 174

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Date of Acquisition and Term Held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and Sale
1959	The part that we have numbered 1A on the attached cadastral became Council Public Road upon the approval of D.P. 164798, circa 1959 This road was subsequently closed The first title to issue after the road closure is Volume 13759 Folio 102 dated 20.12.1978, issuing in the name of Allen Holdings (Australia) Pty Limited	
6.3.1967 (1967 to 1973)	George Alwyn Power (Garage Proprietor)	Book 2839 No. 396
28.2.1973 (1973 to 1977)	Galvina Pty Limited	Book 3084 No. 905
21.7.1977 (1977 to 1980)	Altco Holdings Pty Limited Then Allen Holdings Pty Limited Now Allen Holdings (Australia) Pty Limited	Book 3284 No. 90 Now Vol 13820 Fol 105
As a whole of the Lot		
6.3.1980 (1980 to 1987)	OPF Nominees Pty Limited	Vol 13820 Fol 105
6.10.1987 (1987 to 2006)	Alfred Moss Investments Pty Limited	Vol 13820 Fol 105 Now 1/113118
18.10.2006 (2006 to Date)	# Penrith City Council	1/113118

3.8 Integrity Assessment and Summary of Site History

The Site has been used for residential and commercial purposes since available records indicate. The EPA searches did not indicate that any industrial or commercial activities occurred at, or within close vicinity of, the Site. No dangerous goods storage licences were identified to have been issued for the Site. Based on the range of sources and the general consistency of the historical information, it is considered that the historical assessment has an acceptable level of accuracy with respect to the potentially contaminating activities historically occurring at the Site.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4. Conceptual Site Model

4.1 Potential Areas of Environmental Concern

Based on the Site history review and observations of site conditions during the detailed site inspection, Areas of Environmental Concern (AECs) and associated Contaminants of Potential Concern (COPCs) have been identified and are presented in **Table 4.1**. AECs are graphically represented alongside site features on **Figure 2.**

Table 4.1 Areas of Environmental Concern and Contaminants of Potential Concern

Area of Environmental Concern (AEC)	Contaminants of Concern (COC)
*134-138 Henry Street (Lot 1 DP164798, **Figure 2**)* Improper disposal of dry cleaning chemicals resultant from the operation of the dry cleaner.	Volatile organic compounds (VOCs).
*118 Henry Street (Lot 1 DP113118, **Figure 2**)* Improper management of petroleum hydrocarbons associated with the former service station.	Total recoverable hydrocarbons (TRH), BTEX and heavy metals.
Whole of Site. Fill materials of unknown origin observed to be present as a result of site development activities.	Heavy metals, polycyclic aromatic hydrocarbons (PAHs, TRHs / BTEX, organochlorine pesticides (OCPs) / polychlorinated biphenyls (PCB), VOCs and asbestos.
Whole of Site. Pesticide and herbicide application associated with onsite residential maintenance activities within surficial-moderately deep fill and natural soils.	OCPs, organophosphorus pesticides (OPPs).
Whole of Site Fuel and oil spills associated with onsite residential maintenance activities associated with the residential site use (grass mowing, garden work, home vehicle maintenance, etc.) within surficial-moderately deep fill and natural soils.	TRH, BTEX and heavy metals.
Whole of Site Hazardous building materials associated with existing / former site structures within fill materials.	Asbestos, PCBs and lead.

4.2 Known Contaminated Media

The preliminary ESA, undertaken on Lot 1 DP164798, comprised the advancement of two soil vapour investigation locations advanced through the floor of the dry-cleaner. Soil vapour sampling was undertaken and the two samples were analysed for a range of COPCs. Laboratory analysis of the samples identified the presence of chlorinated solvents (PCE, TCE and DCE) at concentrations exceeding the adopted commercial land use criteria. Additionally, BTEX compounds were identified above the laboratory LOR but below the adopted land use criteria. Soil vapour within the vicinity of Lot 1 DP164798 is considered to be impacted by VOCs.

No soil, material or groundwater assessment was undertaken as part of the preliminary ESA.

4.3 Potentially Contaminated Media

Each of the AECs and corresponding COPCs identified in **Table 4.1** have the potential to result in impact to soil and groundwater (not asbestos). Contaminants including VOCs, TRH and BTEX as associated with fill material, the dry cleaner and former services station also have the potential to result in soil vapour impacts.

It is anticipated the greatest level of potential impact will be to surface or shallow soils. This is a consequence of the surface application of the source of impact, generally comprising soil (waste, ash, lead paint, asbestos, etc) or liquids (fuels, pesticides/herbicides, lubricants, etc.). If impact is found in surface soils, it may be found to have leached / migrated deeper into the soil profile.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Where chlorinated solvents (PCE, TCE and DCE) are identified to be present within the soil vapour, there remains the potential for significant primary source impacts to exist deeper within the soil and/or groundwater at the Site.

Where fill materials are present, soils have been disturbed, or waste material buried, there is a potential that environmental impact may also be present at depth, consistent with the depth of the disturbance. Anthropogenic materials are commonly present in impacted fill materials and can be used as an indication of the depth of disturbance. Where fill materials impacted with chemical based contaminants are identified, there is a potential the impact may have migrated laterally and vertically below the fill material.

Natural soils at depth at the Site are considered potentially impacted by historical site activities (particularly fuel/oil storage and dry-cleaning). The extent of the impact to natural soils will be dependent upon the size and severity of the overlying impact as well as the properties of the natural soils.

4.4 Potential for Migration from Site

Contaminants generally migrate from site via a combination of windblown dusts, rainwater infiltration, groundwater migration and surface water runoff. The potential for contaminants to migrate is a combination of:

- The nature of the contaminants (solid/liquid and mobility characteristics);
- The extent of the contaminants (isolated or widespread);
- The location of the contaminants (surface soils or at depth); and
- The Site topography, geology, hydrology and hydrogeology.

The potential contaminants of concern identified as part of the Site history review and site inspection are generally in solid (e.g. asbestos and metals) liquid (e.g. TPH, PAH, BTEX, OCPs, OPPs and PCBs) or gaseous (e.g. VOCs, BTEX, Volatile TRH) form.

The ground surfaces overlying AECs are primarily comprised of sealed asphaltic or concrete pavements, building footprints with limited unsealed or vegetated ground. As such, there is considered to be a reasonable potential for water soluble contaminants present on hardstand pavements to migrate from the Site via infiltration into the municipal stormwater. Contaminants present within the soil profile are considered unlikely to migrate from the site via infiltration into the municipal stormwater system. Migration from the Site via infiltration into the groundwater is considered to be a likely pathway in the presence of significant liquid and/or liquid soluble (heavy metals) COPCs. Windblown dust is considered to be unlikely unless hardstands and/or vegetation is removed from the Site surfaces during site redevelopment/maintenance activities.

Given the nature of the AECs (dry-cleaning and service station), it is considered likely that localised impacts to soil, groundwater and/or soil vapour may be present at an extent which may result in migration of contamination at a scale where off-site migration would require to be addressed.

4.5 Potential Human and Ecological Receptors

Potential human receptors of environmental impact include future residents, visitors and construction/maintenance contractors engaged to work at the Site, who may potentially be exposed to COPCs through inhalation or direct contact with impacted soils or groundwater present within the Site. Additionally, migration of contaminants via infiltration into the groundwater, windblown dusts and windblown vapour also poses a risk to sensitive human receptors.

Should redevelopment of the Site occur, potential human receptors may in the future include:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Potential dermal contact with and ingestion of impacted soils / groundwater as present at shallow depths and/or accessible by future excavations by site workers and/or occupants; and/or
- Potential Inhalation of vapours migrating upwards and laterally from fill and/or natural soil.

The Site is primarily covered by hardstand pavements and building footprints, however several of the identified AECs have the potential to impact onsite ecological receptors. Possible off-site ecological receptors are limited to potential impacts associated with groundwater and surface runoff water (if present) migrating from the Site via the municipal stormwater system.

4.6 Potential and Complete Exposure Pathways

Future human receptors on the Site could be potentially exposed to soil contaminants by oral, dermal and inhalation pathways. Direct contact pathways (oral and dermal) will only be relevant for near surface soils for most site users. However, potential construction and future intrusive / excavation worker exposures could occur for deeper soils. Inhalation pathways are relevant where asbestos, volatile or semi-volatile COPCs are present.

4.7 Preferential Pathways

For the purpose of this assessment, preferential pathways have been identified as natural and/or man-made pathways that result in the preferential migration of COPC as either liquids or gasses.

Man-made preferential pathways are likely present throughout the Site, generally associated with areas of previously disturbed fill material, service easements, alluvial soil channels, and at near surface depths over the remainder of the Site. Fill materials, including those surrounding subsurface infrastructure, and disturbed natural soil are anticipated to have a higher permeability than the underlying natural soil and/or bedrock, with the exception of the highly permeable Nepean River Gravels anticipated at depth.

Nepean river gravels, anticipated to be present at depth, are considered to be a natural preferential pathway due to their high hydraulic conductivity.

4.8 Source to Receptor Pathway Summary

Table 4.2 below presents a summary of potential source to receptor pathways identified in **Section 4.1** to **4.7.**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 4.2 Conceptual Site Model Source to Receptor Summary

Area of Environmental Concern	Contaminant of Potential Concern / Form	Pathway -> Uptake	Receptor
Lot 1 DP164798 (dry-cleaner)	VOCs / Liquid	Infiltration into the Groundwater -> Biological uptake into the ecosystem	Downstream ecological receptors (Peach Tree Creek) Current and future recreational users and construction/maintenance staff at Peach Tree Creek
		Physical contact -> Oral or dermal ingestion	Current and future construction/maintenance workers and/or occupants of the Site
	VOCs / vapour	Intrusion into buildings and ambient atmosphere -> Inhalation	Current/future site users (construction and maintenance workers and/or occupants)
Lot 1 DP113118 (former service station)	TRH, BTEX / liquid	Infiltration into the Groundwater -> Biological uptake into the ecosystem	Downstream ecological receptors (Peach Tree Creek) Current/future recreational users and construction maintenance staff at Peach Tree Creek
	TRH, BTEX / vapour	Intrusion into buildings and ambient atmosphere -> Inhalation	Current/future site users (construction/maintenance workers and/or occupants)
	Heavy metals / solid	Physical contact -> Oral or dermal ingestion	Current/future site users (construction/maintenance workers and/or occupants)
		Physical Contact -> Biological uptake into root systems	Current and future onsite sensitive ecological receptors (flora)
Whole of Site	Heavy metals / solid	Physical contact -> Oral or dermal ingestion	Current/future site users (construction and maintenance workers and/or occupants)
		Infiltration into the Groundwater -> Biological uptake into the ecosystem	Downstream ecological receptors (Peach Tree Creek) Current and future recreational users and construction/maintenance staff at Peach Tree Creek
	Asbestos / solid	Inhalation	Current/future site users (construction and maintenance workers and/or occupants)
		Off-site migration via windblown dust -> Inhalation	Off-site sensitive human and ecological receptors
		Physical Contact -> Biological uptake into root systems	Current and future onsite sensitive ecological receptors (flora)
	TPH, PAH, BTEX, OCPs, OPPs and PCBs / liquid	Infiltration into the Groundwater -> Biological uptake into the ecosystem	Downstream ecological receptors (Peach Tree Creek) Current and future recreational users and construction/maintenance staff at Peach Tree Creek
		Physical contact -> Oral or dermal ingestion	Current and future construction/maintenance workers and/or occupants of the Site
		Physical Contact -> Biological uptake into root systems	Current and future onsite sensitive ecological receptors (flora)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5. Sampling and Analysis Plan

5.1 Data Quality Objectives

Data quality objectives (DQOs) were developed for the investigation, as discussed in the following sections.

5.1.1 State the Problem

It is understood that the Site owner, Penrith City Council, requires an assessment of the potential risks to human health and the environment associated with site contamination under proposed general development scheme for the Site (**Appendix J)** for the Site.

Information on potential site contamination conditions inferred from the desktop review and observations made during the site inspection resulted in the development of the conceptual site model presented in **Section 4.**

5.1.2 Identify the Decision

Based on the decision making process for assessing urban redevelopment sites detailed in DEC (2006[11]), the following decisions must be made:

- Are there any unacceptable risks to likely future onsite receptors?
- Are there any issues relating to background soil concentrations that exceed appropriate site soil criteria?
- Are there any impacts of chemical mixtures?
- Are there any aesthetic issues at the Site?
- Is there any evidence of, or potential for, migration of contaminants from the Site?
- Is a site management strategy required?

5.1.3 Identify Inputs to the Decision

Inputs identified to provide sufficient data to make the decisions nominated above include:

- Desktop review;
- Detailed site inspection/walkover;
- Physical observations and interpretation of fill and natural material through the collection of soil samples;
- Development of appropriate assessment criteria for evaluation of soil impacts;
- Field parameters measured utilising calibrated equipment during the intrusive investigation including physicochemical parameters of groundwater and assessment of volatile vapours emanating from soils;
- Laboratory analysis of soil, groundwater and soil vapour samples of potentially contaminated media for COPC; and
- Confirmation that data generated by sample analysis are of an acceptable quality to allow reliable comparison to assessment criteria by assessment of quality assurance / quality control as per the data quality indicators established in **Section 5.1.6**.

Specifically, sufficient data needs to be collected from each of the identified potentially impacted media in the identified AEC for the associated COPC (**Table 4.1**).

[11] *'Contaminated Sites: Guidelines for the NSW Site Auditor Scheme, 2nd* Edition', NSW Environmental Protection Authority, EPA 2006

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5.1.4 Define the Study Boundaries

The study boundaries are limited to the cadastral boundaries of the Site. The Site area and approximate Map Grid of Australia (MGA) boundary points are shown on **Figure 2.** The vertical extent of the investigation was to a maximum depth of 15 m, with analysis of soil samples to a maximum depth of 2.0 m bgs.

Due to the project objectives, seasonality was not assessed as part of this investigation. Data are therefore representative of the timing and duration of the current investigation.

5.1.5 Develop and Decision Rule

Soil analytical data were assessed against the appropriate criteria as identified in **Section 6**. Statistical analyses of the data were undertaken, where appropriate in accordance with relevant guidance documents. The following statistical criteria were adopted:

- The 95 % Upper Confidence Limit (UCL) on the average concentration for each analyte (calculated for samples collected from consistent soil horizons, stratigraphy or material types) must be below the adopted criterion;
- No single analyte concentration shall exceed 250 % of the adopted criterion; and
- The standard deviation of the results must be less than 50 % of the criterion.

Statistical analyses were undertaken on datasets generated from environmental samples taken within distinct general site use areas. Where redevelopment of individual lots is proposed, the statistical analyses undertaken are not applicable and analytical data from within the proposed redevelopment lots would need to be assessed independently.

The decision rules adopted to answer the decisions identified in **Section 5.1.2** are summarised in **Table 5.1**.

Table 5.1 Summary of Decision Rules

Decisions Required to be Made	Decision Rule
1. Are there any unacceptable risks to onsite future receptors?	Analytical data was compared against EPA endorsed criteria. Statistical analysis of the data was completed in accordance with relevant guidance documents, as appropriate, to facilitate the decisions. The criteria in **Section 6.2**, and the following statistical criteria were adopted with respect to soils: Either: the reported concentrations were all below the Site criteria; Or: the average site concentration for each analyte was below the adopted site criterion; no single analyte concentration exceeded 250% of the adopted site criterion; and the standard deviation of the results was less than 50% of the Site criterion; And: the 95% UCL of the average concentration for each analyte was below the adopted site criterion. If the statistical criteria stated above were satisfied, the answer to the decision was No. If the statistical criteria were not satisfied, the answer to the decision was Yes.
2. Are there any background contamination issues?	Background soil concentrations as detailed in Trace Element Concentrations in Soils from Rural and Urban Areas of Australia (Henry Olzworthy *Et Al*. 1995[12]) were used for comparison of site soil data. If there were any contaminants at concentrations substantially outside background ranges, then the answer was yes, otherwise the answer was no
2. Are there any chemical mixtures?	Was there more than one group of contaminants present which increase the risk of harm? If there was, the answer to the decision was Yes. Otherwise, the answer to the decision was No.

[12] '*Trace Element Concentrations in Soils from Rural and Urban Areas of Australia*', Henry Olszowy *Et Al*., (Henry Olszowy *et Al.* 1995)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Decisions Required to be Made	Decision Rule
3. Are there any aesthetic issues?	If there were any Asbestos Containing Material (ACM) fragments on the ground surface, any unacceptable odours, any soil discolouration, or excessive amounts of anthropogenic material, the answer to the decision was Yes. Otherwise, the answer to the decision was No.
4. Is there any evidence of, or potential for, migration of contaminants from the Site?	Based on assessment results, was there any evidence of, or the potential for, unacceptable contaminant concentrations to migrate from the Site? If yes, the answer to the decisions was Yes. Otherwise, the answer to the decision was No.
5. Is a site management strategy required?	Is the answer to any of the above decisions Yes? If yes, a site management strategy is required to address unacceptable contamination concerns at the Site so as to make the Site suitable for permissible site uses. If no, a site management strategy is not required and the Site is considered suitable, from a contamination view point for the proposed use.

5.1.6 Specific Limits on Decision Errors

This step is to establish the decision maker's tolerable limits on decision errors, which are used to establish performance goals for limiting uncertainty in the data. Data generated during this project must be appropriate to allow decisions to be made with confidence.

Specific limits for this project have been adopted in accordance with the appropriate guidance from the NSW EPA, National Environmental Protection Measure (NEPM) (NEPC 2013[13]), appropriate Data Quality Indicators (DQIs, used to assess quality assurance / quality control) and standard JBS&G procedures for field sampling and handling.

To assess the usability of the data prior to making decisions, the data will be assessed against pre-determined DQIs for to precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS parameters). The acceptable limit on decision error is 95% compliance with DQIs.

The pre-determined DQIs established for the project are discussed below in relation to the PARCCS parameters, and are shown in **Table 5.2**.

- **Precision** – measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples.
- **Accuracy** – measures the bias in a measurement system. The accuracy of the laboratory data that are generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- **Representativeness** – expresses the degree which sample data accurately and precisely represent a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the Site, and by using an adequate number of sample locations to characterise the Site to the required accuracy.
- **Comparability** – expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; and ensuring analysing laboratories use consistent analysis techniques; and reporting methods.

[13] National Environmental Protection (Assessment of Site Contamination) Measure 1999. As compiled 16 May 2013 National Environmental Council (NEPC 2013)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.
- **Sensitivity** – expresses the appropriateness of the chosen field and laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted site assessment criteria.

Table 5.2 Data Quality Indicators

Data Quality Indicators	Frequency	Data Quality Criteria
Precision		
Split duplicates (intra laboratory)	1 / 20 samples	<50% RPD[1]
Blind duplicates (inter laboratory)	1 / 20 samples	<50% RPD[1]
Laboratory Duplicates	1 / 20 samples	<50% RPD[1]
Accuracy		
Surrogate spikes	All organic samples	70-130%
Laboratory control samples	1 per lab batch	70-130%
Matrix spikes	1 per lab batch	70-130%
Representativeness		
Sampling appropriate for media and analytes	All samples	-[2]
Samples extracted and analysed within holding times.	-	Soil: organics (14 days), inorganics (6 months)
Laboratory Blanks	1 per lab batch	<LOR
Trip spike	1 per lab batch	70-130% recovery
Storage blank	1 per lab batch	<LOR
Rinsate sample	1 per sampling event/media	<LOR
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All Samples
Standard analytical methods used for all analyses	All Samples	NATA accreditation
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples[2]
Limits of reporting appropriate and consistent	All Samples	All samples[2]
Completeness		
Sample description and COCs completed and appropriate	All Samples	All samples[2]
Appropriate documentation	All Samples	All samples[2]
Satisfactory frequency and result for QC samples		95% compliance
Data from critical samples is considered valid	-	Critical samples valid
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted Site assessment criteria	All samples	LOR ≤ site assessment criteria

[1] If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgment will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

[2] A qualitative assessment of compliance with standard procedures and appropriate sample collection methods will be completed during the DQI compliance assessment.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5.2 Optimise the Design of Obtaining Data

Various strategies for developing a statistically based sampling plan are identified in *Contaminated Sites: Sampling Design Guidelines* (EPA 1995), including judgemental, random, systematic and stratified sampling patterns. The adopted sampling methodology is discussed in the following sections.

5.2.1 Soil, Groundwater and Soil Vapour Investigation Program

EPA 1995 recommends that 30 sampling points are conducted for sites up to 2.0 ha.

The presence of significant building footprints precluded the assessment of the site via systematic sampling. As such, a combination of systematic and judgemental sampling was undertaken.

A total of 20 soil investigation locations were placed on a generally systematic grid. An additional eight locations were targeted towards AECs identified during the preliminary ESA, Geo-logix (2016)), desktop review and site inspection phases of the assessment.

The soil sampling and analysis program is presented in **Table 5.3**.

A total of three groundwater monitoring wells were installed as part of the intrusive geotechnical investigation. All three wells were sampled for the purposes of assessing the potential for groundwater contamination at the Site.

A total of ten targeted soil vapour locations were installed surrounding AECs identified to have the potential for soil vapour impacts.

5.2.2 Soil Sampling Methodology

Soil sampling was completed via a combination of manual and mechanical excavation using hand auger, push tube and solid flight auger drilling methods. Soil samples were generally collected from the soil surface or immediately underlying hardstand pavements, and then 0.5 m intervals to a maximum depth of 1.9-2.0 m bgs. Where significantly differing soil stratigraphy was encountered, the soil sampling density was increased to ensure that each material type was sampled for potential analysis.. Soil samples were collected from the surface to natural materials at every investigation location.

During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indicators of contamination were noted. A calibrated Photo Ionisation Detector (PID) was utilised to screen for volatile organic compounds (VOCs) within the sampled material. Calibration records are presented in **Appendix K**.

Soil samples were collected using a trowel and new pair of nitrile gloves and immediately transferred to laboratory supplied sample jars and bags. The sample containers were then transferred to a chilled esky for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form was completed and forwarded with the samples to the testing laboratory. Based upon field observations, samples were analysed in accordance with the analytical schedule detailed in **Table 5.3**.

5.2.3 Groundwater Sampling Methodology

Groundwater Monitoring Well Installation

Three geotechnical investigation locations conducted by PSM were converted into groundwater monitoring wells. Two monitoring wells were installed along the southern border of the Site and one directly adjacent to the dry cleaner to assess groundwater conditions at the boundaries of the site.

Each of the wells was installed to 12 m below ground surface (bgs). The wells were constructed from 50 mm unplasticised polyvinyl chloride (uPVC) screen and casing, combined with a lockable cap and steel gatic cover. The screen was installed such that the encountered water level was within the screened interval, allowing for the detection of Light Non-Aqueous Phase Liquids (LNAPLs), if

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

present. Surrounding the uPVC screen a graded (2mm) sand was utilised to construct a 'gravel pack' which limited clogging of the screen with excess soils. Additionally, above the screened interval, a bentonite seal was installed to reduce the potential for surface water, perched water and/or liquid phase contaminants to enter the well. The steel gatic cover was installed in concrete consistent with the surrounds.

Well Development and Sampling

After installation, the monitoring wells were developed to remove excess silt and sediment resultant from the installation process. The wells were then allowed to settle for a week prior to sampling.

Each monitoring well was then gauged with an Interface Probe (IP) which can detect Non-Aqueous Phase Liquids (NAPLs). If NAPLs were present within the well they were collected with a disposable plastic bailer. If no significant NAPLs were present, the groundwater at each well was then purged with a low flow peristaltic pump, using fresh disposable Low Density Poly-ethylene (LDPE) tubing and silicon, to remove the standing water. During removal, physiochemical parameters (pH, electrical conductivity, dissolved oxygen, reduction-oxidation potential and temperature) were monitored until stabilisation. Groundwater samples were taken from the end of the disposable LDPE tubing after parameter stabilisation has occurred.

Collected groundwater samples were immediately filtered (as necessary) and transferred to laboratory supplied sample bottles. The sample containers were then transferred to a chilled iced box for sample preservation prior to and during shipment to the testing laboratory. A chain of custody form was completed and forwarded with the samples. Samples were analysed in accordance with the laboratory schedule (**Table 5.3**).

5.2.4 Soil Vapour Sampling Methodology

Ten soil vapour probes were installed surrounding identified dry-cleaner and former service station. Soil vapour probes were installed via the following process:

- Clearance of proposed soil vapour locations by a professionally licenced service locator;
- Puncture of surface hardstand (concrete or asphaltic pavement) via rotary hammer drill, with a 20 mm drill bit, through to the underlying soils;
- 'Flossing' of the drill hole to remove excess concrete dust and/or soil;
- Installation of a 200 – 400 mm nylon tube, fitted with steel mesh filter on the bottom and closed three-way on the accessible end, into the drill hole;
- Sealing of the drill hole via application of of air drying clay covered by a concrete/bentonite slurry;
- Application of a 'shroud' comprising an air tight container lined with isopropyl alcohol doused material to the base of the nylon tube, where sealed in place with the bentonite slurry;
- Purging of the drill hole via pumping through a calibrated mx6 multi-gas detector;
- Concentrations of oxygen (O_2), VOCs and carbon dioxide (CO_2) were monitored throughout purging until stabilization had occurred;
- Where detections of VOCs indicated a leak was present and isopropyl alcohol vapour was intruding into the nylon tube, the soil vapour probe was removed and reinstalled;
- Where purging was successful, and no leak was indicated by monitored parameters, 6.0 L of soil vapour was removed from the sub-slab vapour probe using a 140 mL hand drawn syringe. The syringe was connected to the back end of a carbon tube with a separate three-

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

way valve, allowing for soil vapour to be drawn over the activated carbon, and then expelled through an exhaust valve; and

- Removal of the soil vapour probe post-sampling and reinstatement of the drill hole with concrete, consistent with the surrounds.

5.2.5 Decontamination

Prior to the commencement of sampling activities, non-disposable sampling equipment, including the hand trowel and hand auger, was cleaned with a high-pressure water/detergent spray, rinsed with water and then air dried. The equipment was then inspected to ensure that no soil, oil, debris or other contaminants were apparent on the equipment prior to the commencement of works.

Push tube sleeves were removed from the advancement casing and laid on clean plastic sheets for inspection, soil samples were collected directly from the push tube sleeve. A new pair of disposable nitrile gloves were used to collect each sample.

Sampling equipment including, hand trowels, hand augers and the push tube head were subsequently decontaminated using the above process between each sampling location and new disposable liners were used at each location advanced via push tube. Decontamination records are presented in **Appendix K**.

A rinsate sample from the trowel was collected at the completion of field sampling activities to determine the effectiveness of the decontamination procedures implemented on re-usable sampling equipment.

5.2.6 Duplicate and Triplicate Sample Preparation

At selected sample locations, sufficient soil or groundwater was collected to provide a primary, blind (intra-laboratory) duplicate and split (inter-laboratory) duplicate (triplicate) sample using the sampling methodology outlined above.

The collected soil samples were divided laterally into three samples with minimal disturbance to reduce the potential for loss of volatiles and placed in three clean glass jars and sample bags as appropriate. Soil samples were not homogenised in order to minimise the loss of volatiles.

The collected groundwater samples were extracted from the groundwater wells after purging and placed consecutively into the primary, blind and split duplicates. Groundwater samples were not homogenised in order to minimise the loss of volatiles.

The collected soil vapour samples were extracted from soil vapour probes after purging. The soil vapour probe at location SV01 was left for a period of 1 hour after the primary soil vapour sample was extracted to allow for pressure equalization and then subsequently resampled to collect a blind duplicate. A split duplicate was not collected for soil vapour samples due to the inconsistency of analytical laboratory methods.

Each sample was labelled with primary, duplicate or triplicate sample identification before being placed in the same chilled esky for transport to the laboratory.

5.2.7 Laboratory Analysis

JBS&G contracted Eurofins MGT (Eurofins) as the primary laboratory for the required chemical analyses. The secondary laboratory was Envirolab Services Pty Ltd (Envirolab). Both laboratories were NATA accredited for the required analyses. In addition, the laboratories were required to meet JBS&G's internal quality assurance/quality control (QA/QC) requirements. The completed analysis schedule is summarised in **Table 5.3.**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 5.3 Analytical Schedule

Sample Type	No. of Sampling Locations	Analyses (exc. QA/QC)
Soil	20 borehole sampling locations 8 hand auger locations	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn) – 35 samples TRH/BTEX – 20 samples PAH/Phenols – 20 samples VOCs – 15 samples Asbestos – 20 samples (500 ml NEPC 2013) + visual OCPs – 8 samples PCBs – 8 samples Ecological parameters – 4 samples
Vapour	10 sub-slab vapour locations	VOCs 8260 – 10 samples TRH – 3 samples Isopropanol – 10 samples
Water	3 Groundwater Wells	Heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb, Zn) – 3 samples TRH/BTEX – 3 samples PAH low levels – 3 samples VOCs – 3 samples

In addition to the above primary analyses, to address the DQIs, field duplicate and triplicate soil samples were analysed at a rate of one per 20 primary samples. A rinsate sample was obtained from non-disposable soil sampling equipment each day that soil or groundwater sampling was undertaken, plus a single trip spike and single trip blank accompanied each sample batch.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6. Assessment Criteria

6.1 Regulatory Guidelines

Development of site assessment criteria and the associated scope of investigation was undertaken with consideration to aspects of the following guidelines, as relevant:

- *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1)*, National Environment Protection Council (NEPC 2013);
- *Contaminated Sites: Sampling Design Guidelines*, NSW EPA, 1995 (EPA 1995);
- *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*, NSW OEH, 2011 (OEH 2011); and
- *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme*, 2nd Edition, NSW EPA, 2006 (DEC 2006).

6.2 Assessment Criteria Selection

As per the decision process for assessment of urban development site (DEC 2006), a set of health and ecological assessment thresholds derived from NEPC (2013) was used for evaluation of site contamination data collected for this assessment. Given the proposed mixed uses of the Site (residential, public open space and commercial/industrial), as noted in **Section 1.1**, the Site has been compared distinct land use criteria for each of the proposed development areas. The western site portion falls within the 'Proposed Green Spaces' and the eastern portion of the Site falls within the Proposed Building Development and Green Spaces portion (as shown on **Figure 2**). The Site is zoned Commercial Core (B3) and Public Recreation (RE1) under the Penrith Local Environmental Plan 2010 (Penrith 2010).

Where there are no NSW EPA endorsed thresholds for individual COPC the laboratory limit of reporting (LOR) was adopted as an initial screening value for the purposes of this assessment.

The results of asbestos analysis were assessed in general accordance with NEPC (2013) including DOH (2009[14]) guidance.

The adopted site criteria are presented in **Table A,** the soil analytical summary tables. Relevant guidelines have been adopted from Section 6 of Schedule B1 NEPC (2013) and are presented below:

Health Based Criteria

Relevant tables:

- Table 1A(1) 'Health Investigation Levels for Soil contaminants';
- Table 1A(2) 'Interim Soil Vapour Health Investigation Levels for Volatile Organic Chlorinated Compounds';
- Table 1A(3) Soil HSLs for Vapour Intrusion;
- Table 1A(4) Groundwater HSLs for Vapour Intrusion; and
- Table 1A(5) Soil Vapour HSLs for Vapour Intrusion.

Proposed Building Development and Green Spaces

Land use scenarios adopted:

[14] *Guidelines for the Assessment Remediation and Management of Asbestos-Contaminated Sites in Western Australia*, May 2009. Western Australia Department of Health (DOH), (DOH 2009)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Residential with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments (HIL-B and HSL-B);
- Public open space such as parks and playgrounds (HIL-C and HSL-C);
- Commercial/industrial; including premises such as shops and offices (HIL-D and HSL-D);

Proposed Green Spaces

The land use scenario adopted for Proposed Green Spaces site portion is 'public open space such as parks and playgrounds (HIL-C and HSL-C)'

Ecological Screening Levels

Ecological Screening Levels (ESLs) for the site were obtained from Table 1B(6) 'ESLs for TPH Fractions F1-F4, BTEX and Benzo(a)pyrene in Soil' under 'Urban residential and public open space' and 'commercial and industrial' land use scenarios.

Management Limits

Management limits for consideration of the formation of Light Non-Aqueous Phase Liquids (LNAPLS), fire and explosive hazards, and effects on buried infrastructure have been obtained from Table 1B(7) 'Management Limits for TPH Fractions F1-F4 in Soil' under 'Urban residential and public open space' and 'commercial and industrial' land use scenarios. Based on site observations discussed in **Section 8.1**, a fine soil texture was adopted for comparison of results.

6.2.1 Groundwater Investigation Levels

No registered groundwater bores have been identified as being used for the extraction of drinking water and given the urbanised nature of the Site, it is not expected that water within the relevant aquifer is utilised by the public for the purposes of drinking through direct extraction. However, as a conservative criteria set, the health and aesthetics based Australian Drinking Water Guidelines NWQMS (2016[15]) for drinking water have been adopted for the purposes of the assessment. A conservative criteria set for the assessment of worker exposure risk during redevelopment works involving interaction with groundwater has been adopted from the NWQMS (2016) as 10x the drinking water criteria for health and aesthetics.

To assess the potential risk of contaminated groundwater migrating from the Site to Peach Tree Creek, reference has been made to the Australian and New Zealand Guidelines for Fresh and Marine Water Quality ANZECC ARMCANZ (2000[16]) Table 3.4.1 'Trigger values for toxicants at alternative levels of protection'. Given the heavily urbanised nature of the receiving water body, a 95 % protection of species value has been adopted.

6.2.2 Derivation of Site Specific Ecological Investigation Levels

Site specific EILs were derived in accordance with the methodology outlined within NEPC (2013). Added Contaminant Limits (ACLs) were obtained from the following tables within the NEPC (2013):

- Table 1B(1) Soil-specific Added Contaminant Limits for Aged Zinc in Soil;
- Table 1B(2) Soil-specific Added Contaminant Limits for Aged Copper in Soil;
- Table 1B(3) Soil-specific Added Contaminant Limits for Aged Chromium III and Nickel in Soil;
- Table 1B(4) Generic Added Contaminant Limits for Lead In Soils Irrespective of Their Physicochemical Properties; and

[15] *'Australian Drinking Water Guidelines 6'*, National Water Quality management Strategy, Version 3.3, November 2016, NWQMS (2016)

[16] *'Australian and New Zealand Guidelines for Fresh and Marine Water Quality – The Guidelines'*, October 2000, Australian and New Zealand Environment and Conservation Council / Agriculture and Resource Management Council of Australia and New Zealand, Volume 1, Chapters 1-7, ANZECC ARMCANZ (2000)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Table 1B(5) Generic EILs for Aged Arsenic, Fresh DDT and Fresh Naphthalene in Soils Irrespective of Their Physicochemical Properties.

Four representative soil samples (JB01 1.1-1.2, JB11 0.35-0.45, JB12 1.1-1.2 and JB20 1.9-2.0) were submitted for laboratory analysis to determine physical parameters including Cation Exchange Capacity (CEC), pH and % Clay. Detailed laboratory reports and chain of custody documentation is provided in **Appendix L**.

Values for Average Background Concentrations (ABCs) were obtained from Trace Element Concentrations in Soils from Rural and Urban Areas of Australia (Henry Olzworthy *Et Al*. 1995).

Table 6.1 details ABCs, Added Contaminant Limits and derived EILs. All values are in mg/kg unless otherwise specified.

Table 6.1 Derivation of EILs

Physical Parameters					
Sample	**Cation Exchange Capacity (meq/100g)**	**pH (pH units)**		**% Clay**	
JB01 1.1-1.2	13	5.6		43	
JB11 0.35-0.45	17	8.3		28	
JB12 1.1-1.2	13	7.7		39	
JB20 1.9-2.0	20	7.6		30	
Conservative Value->	15.75	7.3		35	
Investigation Levels					
		ACL		**EIL**	
Contaminant	**ABC**	**Residential / Open Space**	**Commercial / Industrial**	**Residential / Open Space**	**Commercial / Industrial**
Arsenic	Not Applicable	100	160	100	160
Chromium (III)	12	400	660	412	672
Copper	49	130[1]	190[1]	179	239
DDT	Not Applicable	180	640	180	640
Lead	303	1100	1800	1403	2103
Naphthalene	Not Applicable	170	370	170	370
Nickel	6	170	290	176	296
Zinc	142	270[2]	420[2]	412	562

[1] Selected utilising the pH value to determine the most conservative ACL.
[2] Selected based on value for pH and CEC resulting in the most conservative ACL.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7. Quality Assurance/Quality Control

7.1 QA/QC Results

Analysis of the Quality Analysis / Quality Control (QA/QC) has been undertaken for the analytical results as summarised in **Table 7.1** and discussed in **Section 7.2**. Detailed QA/QC results are included in the laboratory reports in **Appendix L**, and in the Quality Assurance/Control in **Appendix M.**

Table 7.1 QA/QC Results Summary

Data Quality Indicator	Results	DQI met?
Precision		
Soil Blind duplicates (intra laboratory)	0-98 % RPD Intra laboratory samples were analysed at a rate greater than 1 in 20 samples.	Partial[1]
Soil split duplicates (inter laboratory)	0-61 % RPD Inter laboratory samples were analysed at a rate greater than 1 in 20 samples.	Partial[1]
Groundwater blind duplicates (intra laboratory)	0-100 % RPD Intra laboratory samples were analysed at a rate of 1 in 3 samples.	Partial[1]
Groundwater split duplicates (inter laboratory)	0-153 % RPD Inter laboratory samples were analysed at a rate of 1 in 3 samples.	Partial[1]
Soil vapour blind duplicate (intra laboratory)	0 % RPD Intra laboratory samples were analysed at a rate of 1 in 10 samples.	Yes
Laboratory duplicates	0-50 % RPD Intra laboratory samples were analysed at a rate of 1 in 20 samples.	Yes
Accuracy		
Surrogate spikes	INT-139% Recovery Surrogate spikes were completed for all organic samples	Partial[1]
Laboratory Control Samples	54-130 % Recovery Laboratory control samples were completed for all organic and metals samples	Partial[1]
Matrix spikes	51- 131% Recovery Matrix spikes were completed for all organic and metals samples	Partial[1]
Representativeness		
Sampling appropriate for media and analytes	All sampling conducted in accordance with JBS&G procedures	Yes
Laboratory blanks	<LOR – EQL	Partial[1]
Samples extracted and analysed within holding times.	Samples analysed for VOCs were extracted outside of holding times	Partial[1]
Trip spikes	85%-111%	Yes
Trip blanks	<LOR	Yes
Rinsate blank	<LOR-EQL	Partial[1]
Comparability		
Standard operating procedures used for sample collection & handling	Three JBS&G field scientists used standard operating procedures throughout works.	Yes
Standard analytical methods used	Standard analytical methods used as listed detailed in **Appendix L**	Yes
Consistent field conditions, sampling staff and laboratory analysis	Sampling was conducted by three field staff members using standard operating procedures in the same conditions throughout the works. The laboratories remained consistent throughout the investigation.	Yes
Limits of reporting appropriate and consistent	Limits of reporting were consistent and appropriate.	Yes
Completeness		

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Data Quality Indicator	Results	DQI met?
Soil description & Chains of Custody completed	All borehole logs and Chains of Custody were completed appropriately.	Yes
Appropriate documentation	All appropriate field documentation processes were undertaken. Borehole logs and Calibration/ Decontamination records are included as **Appendix K**.	Yes
Satisfactory frequency/result for QC samples	The QC results are considered adequate for the purposes of the investigation.	Yes
Data from critical samples is considered valid	Data from critical samples is considered valid.	Yes
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	Appropriate laboratory analysis methods and detection limits were considered to have been achieved during the field and laboratory phases of this investigation.	Partial[1]

1. See discussion of DQI exceedances in **Section 7.2**.

7.2 QA/QC Discussion

7.2.1 Precision

Soil Duplicates

The primary soil sample analytical results were within the acceptable limits of deviation from the intra laboratory duplicate analytical results for all analytes with the exception of the following:

- Copper (55 % - JB09 0.15-0.20 and QC20170506-2); and
- Zinc (98 % - JB09 0.15-0.2 and QC20170506-2).

The primary soil samples analytical results were within the acceptable limits of deviation from the inter laboratory duplicate analytical results for all analytes with the exception of the following:

- Arsenic (6 % - JB18 0.1-0.2 and QA20170506-1);
- Chromium (36 % - JB09 0.15-0.2 and QA20170506-2); and
- Copper (60 % - JB09 0.15-0.2 and QA20170506-2).

The RPDs for the intra-laboratory and inter-laboratory duplicates are presented in **Appendix M** and are considered to be the result of heterogeneity in the soil samples collected. The elevated RPD results are not considered to influence the outcome of the investigation.

Groundwater Duplicates

The primary groundwater samples were within the acceptable limits of deviation from the intra laboratory duplicate analytical results for all analytes with the exception of the following analytes:

- Mercury (inorganic) (67 % - PSM01 and QC01-W);
- TPH Fraction C_{15}-C_{28} (93 % - PSM01 and QC01-W); and
- TRH Fraction C_{16}-C_{34} (100 % - PSM01 and QC01-W).

The primary groundwater samples agreed with the inter laboratory duplicate analytical results for all analytes with the exception of the following analytes:

- Mercury (inorganic) (67 % - PSM01 and QC01-W/A);
- TPH Fraction C_{15}-C_{28} (144 % - PSM01 and QC01-W/A); and
- TRH Fraction C_{16}-C_{34} (153 % - PSM01 and QC01-W/A).

The RPDs for the intra-laboratory and inter-laboratory duplicates are presented in **Appendix M** and are considered to be the result of heterogeneity in the groundwater samples collected. The elevated RPD results are not considered to influence the outcome of the investigation.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Soil Vapour Duplicates

The primary soil vapour sample analytical results agreed with the intra laboratory duplicate analytical results for all analytes.

All laboratory duplicates returned RPDs within the acceptable limits.

On this basis the DQIs for precision are considered to have been achieved for this investigation.

7.2.2 Accuracy

Surrogate spike recoveries were within the acceptable range of 70-130%, with the exception of the following over-recoveries:

OCP Surrogates:

- Dibutylchlorendate with a recovery of 134 % in sample JB11 0.05-0.15.

PAH Surrogates:

- p-terphenyl-d14 with recoveries of 134 % (JB01 0.05-0.3), 142 % (RINS 6-5-17) and 145 % (RINS 7-5-17); and
- 2-Fluorobiphenyl with a recovery of 146 % (JHA01 0.25-0.4).

VOC Surrogates:

- 4-bromofluorobenzene with recoveries of 141 % (JB17 0.1-0.25) and 149 % (JB14 0.1-0.3); and
- fluorobenzene with a recovery of 132 % in sample SV05_FRONT.

These deviations from the acceptance criteria were not considered to have an impact on the conclusions of this assessment as no OCP, PAH or VOC compounds were reported above the assessment criteria in any of the analysed samples. Given the potential for over-reporting indicated by these deviations from the accuracy DQO, the actual concentrations of OCP, PAH or VOC compounds are likely to be less than those reported in these samples. The following under-recoveries of surrogates occurred:

OCP Surrogates:

- Tetrachloro-m-xylene with a recovery of 62 % in sample RINS 26-5-17.

PAH Surrogates:

- No recovery percentage was provided for 2-Fluorobiphenyl in sample RINS 26-5-17, laboratory notes indicated that interference occurred within the sample matrix. 2-Fluorobiphenyl was reported to be recovered 67 % (PSM01), 67 % (PSM02), 68 % (PSM03) and 63 % (QC01_W); and
- No recovery percentage was provided for p-Tertphenyl-d14 in sample RINS 26-5-17, laboratory notes indicated that interference occurred within the sample matrix. p-Tertphenyl-d14 was reported to be recovered 67 % in sample JHA04 0.2-0.4.

VOC Surrogates:

- Fluorobenzene with a recovery of 67 % (RINS 26-5-17), 63 % (JHA07 0.4-0.6), 59 % (JHA07 1.3-1.5), 68 % (PSM01), 69 % (QC01_W) and 59 % (QC20170526-1);
- 4-Bromofluorobenzene with a recovery of 68 % (JHA01 0.25-0.4), 63 % (JHA02 0.3-0.5) and 65 % (JHA06 0.4-0.6).

Interference in the sample matrix RINS 26-5-17 and potential under reporting of COPCs is not considered to have affected the accuracy of the dataset for drawing conclusions with respect to the

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

decision rules noted in **Section 5.1.5**. It is noted that all samples listed above were within the NATA acceptable limits of 50-150 %, with the exception of the interference noted within RINS 26-5-17, for the analytical methods undertaken.

Laboratory control sample (LCS) recoveries were within the acceptable range of 70-130% except for two speciated phenols. Slight under recoveries for speciated phenols are not considered to have resulted in deviation, from DQOs pertaining to accuracy, such that the dataset cannot be relied upon for making the decisions listed in **Section 5.1.5.**

Matrix spike recoveries were within the acceptable range of 70-130% except for sample JHA06 1.0-1.2. A matrix spike for OCPs was undertaken in which a recovery of 51 % was achieved, indicating sample matrix interference. No OCPs were detected within this sample, and the LOR was significantly less than the site criteria for all OCPs. Under-recovery for this sample is still within the tolerable limits with regards to making decisions using the dataset.

On this basis the DQIs for accuracy are considered to have been achieved for this investigation.

7.2.3 Representativeness

The extraction and analysis of selected soil samples was completed within the recommended holding times for all analytes.

A rinsate sample was collected following decontamination of all non-disposable sampling equipment for each day of the primary soil sampling event and the subsequent targeted soil sampling / groundwater monitoring event. All analyte concentrations in the rinsate blanks were below the laboratory limit of reporting (LOR) with the exception of chromium and copper. Chromium (in RINS 6-5-17 and 7-5-17) and copper (RINS 26-5-17) were detected at the reporting limit. No statistically significant exceedances of the site criteria for these heavy metals were reported and therefore the potential for cross contamination has not detrimentally affected the representativeness of the dataset for the intended purpose. Decontamination records are presented in **Appendix K**.

A trip spike was submitted with the soil samples collected during the assessment. Trip spike recoveries for analytes was within the acceptable limit of 70-130%.

A trip blank was submitted with each laboratory batch for soil or groundwater samples collected during the assessment. There were no reported concentrations of BTEX compounds above the laboratory LOR.

All laboratory blanks analysed reported analyte concentrations less than the laboratory LOR with the exception of the following:

- 4-Nitrophenol (0.001 mg/L);
- Benzo(a)anthracene (0.001 mg/L);
- Benzo(b&j)fluoranthene (0.001 mg/L); and
- Chrysene (0.001 mg/L).

No detections of the aforementioned analytes were reported at or near the adopted site criteria, therefore potential laboratory contamination has not affected the reliability of the dataset for the intended purpose.

All field equipment was decontaminated appropriately as per the procedure identified in **Section 5.2.3**. Collected samples were immediately placed into the sample containers, sealed and then placed into chilled eskies to minimise volatile loss.

Based on the above comments the DQIs for representativeness were considered to have been satisfactorily achieved.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.2.4 Comparability

Eurofins, the primary laboratory, and Envirolab Services, the secondary laboratory, are NATA accredited for all analytical methods used. The laboratories used similar analytical methods and the analytical data were comparable between laboratories as indicated by the results of duplicate analysis. Where different LORs were adopted by the laboratories, this did not impact upon the usability of the data given that all values were considerably less than the adopted assessment criteria.

The samples collected for assessment purposes are considered comparable as all samples were collected by experienced JBS&G personnel in accordance with standard JBS&G sampling methods.

7.2.5 Completeness

All laboratory and field documentation is complete and correct. Chain of custody documentation is provided with laboratory reports in **Appendix M**. Bore hole logs are presented in **Appendix N**.

The frequency of analysis of all QA/QC samples was considered appropriate and valid.

7.2.6 Sensitivity

The adopted soil analytical methods provided suitable LORs with respect to the adopted site assessment criteria.

7.2.7 QA/QC Conclusions

The field sampling and handling procedures across the Site produced QA/QC results which indicate that soil, groundwater and soil vapour data collected is of an acceptable quality.

The NATA certified laboratory reports indicate that the project laboratories were achieving levels of performance within its recommended control limits during the period when the samples from this program were analysed.

On the basis of the results of the field and laboratory QA/QC program, the soil data is of an acceptable quality upon which to draw conclusions regarding the environmental condition of the Site.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8. Results

8.1 Soil Observations

Soil sampling was conducted on 6, 7 and 26 May 2017 at the sampling locations shown on **Figure 3A**. Borehole logs are included in **Appendix N**.

As discussed in **Section 2.2**, the majority of the Site is covered by buildings, concrete slabs and asphaltic pavement. Unsealed surfaces were comprised entirely of tree/garden beds with surface gravel cover.

A summary of soil conditions present at the Site is presented as follows. A total of twenty environmental boreholes were advanced for the purposes of soil sampling, as well as nine boreholes advanced for the purposes of geotechnical investigation, via mechanical drill rig. Additionally, eight hand augers were advanced from the ground surface to natural material. Fill material was encountered to depths ranging between 0.2 and 2.0 m below ground surface (m bgs), with natural materials generally being encountered between 0.2 and 0.4 m bgs. Fill material comprised a range of silts and clays which varied in sand content, colours were observed to be primarily brown and grey with some orange/yellow clays also observed. Fill contained varying proportions of gravels, however indicators of anthropogenic materials were observed. Three distinct natural materials were encountered during the investigation: (0.2m – 10.5 m bgs) silty/sandy clay which graded to a higher sand content with depth, (6.1 m – 13.0 m) Nepean River gravels and (>11.7 m) shale bedrock.

No ACM, odours or staining were observed on site surfaces or within the soil profile at any investigation location. No PID readings >1 ppm were observed during field screening for volatiles during soil sampling.

8.2 Soil Contamination Analytical Results

Detailed laboratory reports and chain of custody documentation are provided in **Appendix L**. Summarised soil analytical data for COPCs are presented in **Table A(1)** and **Table A(2)**. Statistical analyses undertaken on the data set are presented in **Appendix P** and are discussed in **Section 8.2.1 to Section 8.2.6**.

8.2.1 Metals

Individual heavy metals concentrations were reported at levels less than the adopted health and ecological based assessment criteria with the exception of the following:

The concentration of lead in sample JHA02 0.3-0.5 (910 mg/kg) exceeded the HIL-C investigation criterion. The concentration of lead reported in JHA02 0.3-0.5 is less than 250 % of the HIL-C site investigation criterion, the standard deviation for the lead concentration dataset for fill samples collected within the 'Proposed Green Spaces' development area was less than half of the HIL-C criterion and the 95 % UCL for the data set was less than the HIL-C criterion. The analysis shows that this exceedances of the HIL-C lead criterion is not statistically significant and thus the concentration is unlikely to pose a risk to future human receptors.

The concentrations of copper in samples JHA02 0.1-0.3 (230 mg/kg) and JHA02 0.3-0.5 (910 mg/kg) exceeded the EIL-B investigation criterion. The concentrations reported in both samples were less than 250 % of the EIL-B site investigation criterion, the standard deviation for the copper concentration dataset for fill samples collected within the 'Proposed Green Spaces' development area was less than half of the EIL-B criterion and the 95 % UCL for the dataset was less than the EIL-B criterion. The analysis shows that this exceedances of the EIL-B copper criterion is not statistically significant and thus the concentration is unlikely to pose a risk to future ecological receptors at the site.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.2.2 Polycyclic Aromatic Hydrocarbons

Total PAH, B(a)P and carcinogenic PAHs as B(a)P Toxic Equivalence Quotient (TEQ) values for the analysed samples were generally reported at concentrations less than the adopted site assessment criteria. One notable exception is the concentration of B(a)P at location JHA02 0.3-0.5 (0.9 mg/kg), which exceeded the adopted ESL for the Residential and Public Open Space' land use scenario. Statistical analysis of this exceedance as part of the larger dataset for B(a)P concentrations within fill materials at the Site indicated that this minor exceedance did not comprise a statistically significant exceedance of the Site criterion.

8.2.3 Total Recoverable Hydrocarbons and BTEX Compounds

Concentrations of all TRH were reported below the adopted health and ecological site assessment criteria in all soil samples selected for analysis.

Concentrations of all BTEX were reported below the adopted health and ecological site assessment criteria in all soil samples selected for analysis.

8.2.4 Organochlorine Pesticides and Polychlorinated Biphenyls

Concentrations of OCP compounds were reported below the adopted health and ecological assessment criteria for all soil samples selected for analysis.

Concentrations of total PCB compounds were reported below the adopted health and ecological assessment criteria for all soil samples selected for analysis

8.2.5 Volatile Organic Compounds

Concentrations of all VOCs were reported to be below the adopted health and ecological assessment criteria for all samples selected for analysis.

8.2.6 Asbestos

ACM was not observed during site sampling activities. Asbestos was not detected at concentrations above the assessment criteria in soil samples submitted to the laboratory for analysis although trace asbestos fines were identified in near surface fill at JB11.

8.3 Groundwater Field Observations

A groundwater monitoring event (GME) was conducted on 26 May 2017 by Rohan Hammond, an appropriately trained and experienced environmental consultant. A summary of groundwater conditions encountered during the GME is presented in **Table 8.1, Table 8.2** and **Table 8.3** below. Groundwater monitoring well locations are provided on **Figure 3B**.

Table 8.1 Groundwater Geospatial Characteristics

Well Reference	Easting	Northing	Relative Level (m below PSM03)	Depth to Groundwater (m below top of casing)	Relative Groundwater Level (Below PSM02)
PSM01	286759	6262856	-1.22	6.96	-0.17
PSM02	286646	6262847	-1.06	6.95	0
PSM03	286617	6262929	0	8.05	-0.04

Based on the data presented above, and assuming relatively consistent subsurface conditions are present across the Site, the inferred groundwater flow direction is northwest with a gradient of 0.007 m head per metre in the direction of groundwater flow.

Table 8.2 Groundwater Field Physicochemical Parameters

Well Reference	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	pH (units)	Oxidation Reduction Potential (mV)[1]	Temperature (°C)
PSM01	0.31	6770	6.65	-219.0	20.7
PSM02	0.06	1675	7.05	-242.1	20.9
PSM03	0.18	5403	7.11	-131.9	22.0

1. Oxidation Reduction Potential was measured with an Ag/AgCl probe in a solution of 3.5 moles potassium chloride and deionized water.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 8.3 Groundwater Field Physicochemical Parameters

Well Reference	Odour	Sheen	Turbidity	Colour
PSM01	Non-odorous	No sheen	Slightly turbid	brown
PSM02	Sulphide odour	Slight oily sheen	Turbid	Dark brown
PSM03	Non-odorous	No sheen	Slightly turbid	Grey

8.4 Groundwater Analytical Results

Detailed laboratory reports and chain of custody documentation are provided in **Appendix L**. Summarised soil analytical data for COPCs are presented in **Table B(1)**. The results are discussed in **Section 8.4.1 to Section 8.4.4**.

8.4.1 Metals

Heavy metals concentrations within the analysed samples were all reported to be below the adopted site assessment criteria.

8.4.2 Total Recoverable Hydrocarbons and BTEX Compounds

TRH compounds were all reported to be at concentrations below the adopted site criteria within the analysed samples. It is noted that concentrations of TRHs significantly above LOR, were detected at PSM02. During the installation of PSM02, a polymer emulsion fluid (EZ-MUD) was utilised to facilitate advancement of the borehole into underlying shale bedrock. TRHs were also detected at PSM01 and PSM03, where installation did not require the use of the Polymer emulsion fluid.

BTEX compounds were generally reported to be at concentrations below the adopted site criteria with the notable exception of toluene. Toluene was detected at a maximum concentration of 0.094 mg/L in the groundwater sample collected at PSM01 (within triplicate sample QC01-W/A), exceeding the health and aesthetic based drinking water criteria.

8.4.3 Polycyclic Aromatic Hydrocarbons

PAH compounds were all reported to be at concentrations below the adopted site criteria within the analysed samples.

8.4.4 Volatile Organic Compounds

VOC compounds were generally reported to be at concentrations below the adopted site criteria within the analysed samples with the exception of the tetrachloroethene, which was detected at a concentration of 0.059 mg/L in the groundwater sample taken from PSM01, exceeding the health based drinking water criterion of 0.05 mg/L.

8.5 Soil Vapour Contamination Analytical Results

Detailed laboratory reports and chain of custody documentation are provided in **Appendix L**. Summarised soil analytical data for COPCs are presented in **Table C(1)**. Results are discussed in **Section 8.4.1** to **Section 8.4.2**.

Concentrations of contaminants within soil vapour were converted from total mass values provided within laboratory documentation via the application of conversion factor as shown below.

$$Concentration\ in\ \frac{mg}{m^3} = \frac{laboratory\ result\ (in\ \mu g) * 1000}{\left(\frac{1000}{6\ L\ sample\ Volume}\right)}$$

8.5.1 Volatile Organic Compounds

Concentrations of VOCs were generally reported to be below the laboratory LOR and the relevant site assessment criteria. The following chlorinated solvents were reported to have been detected within the carbon media at masses indicating exceedances of the site assessment criteria.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Tetrachloroethane (PCE):

- SV04: 10 µg of PCE was detected within the carbon medium indicating a soil vapour concentration of 1.667 mg/m^3;
- SV05: 340 µg of PCE was detected within the carbon medium indicating a soil vapour concentration of 56.67 mg/m^3; and
- SV10: 87 µg of PCE was detected within the carbon medium indicating a soil vapour concentration of 14.5 mg/m^3.

Trichloroethene (TCE);

- SV05: 56 µg of TCE was detected within the carbon medium indicating a soil vapour concentration of 9.33 mg/m^3; and
- SV10: 21 µg of TCE was detected within the carbon medium indicating a soil vapour concentration of 3.5 mg/m^3.

8.5.2 Total Recoverable Hydrocarbons

A single detection of TRH above the laboratory LOR was reported in sample SV04; 11 µg of TRH was detected indicating a soil vapour concentration of 1.833 mg/m^3. This concentration is significantly less than the site assessment criteria.

The balance of the carbon tubes analysed were not identified to contain TRHs above the laboratory LOR.

8.6 Waste Classification

A preliminary waste classification has been undertaken based on the available soil analytical data. Summarised soil analytical data compared against waste classification criteria is provided in **Table D(1)**.

COPCs were generally reported to be at concentrations below the GSW waste classification criteria except for minor metals and PAH exceedances as discussed below. Indicative waste classifications for each of the analysed samples is provided in **Table D(1)**

Heavy Metals Exceedances

Lead

Lead was generally reported to be at concentrations less than the GSW waste classification criterion (100 mg/kg) with the exception of the following samples: JB01 0.05-0.3 (110 mg/kg), JB03 0.05-0.2 (120 mg/kg), JB04 0.4-0.5 (110 mg/kg), JB05 0.1-0.2 (120 mg/kg), JB20 1.7-1.8 (110 mg/kg), JHA02 0.1-0.3 and JHA02 0.3-0.5.

JHA02 0.1-0.3 and JHA02 0.3-0.5 were submitted to a Toxicity Characteristic Leachate Procedure (TCLP) and the leachate fluid was analysed for lead concentrations. Comparison against SCC1 and TCLP1 has indicated results less than the relevant criterion and is therefore classified as GSW.

Nickel

Nickel was generally reported to be at concentrations less than the GSW waste classification criterion (40 mg/kg) with the exception of samples JB12 0.1-0.25 which was reported at a concentration of 75 mg/kg and JHA04 0.2-0.4 with a reported concentration of 58 mg/kg. No leach testing was undertaken for this material and as a result the preliminary classification is RSW.

PAHs

PAHs were all reported to be at concentrations less than the GSW waste classification criteria with the exception of Benzo(a)pyrene in sample JHA02 0.3-0.5, which was reported to be at a

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

concentration of (0.9 mg/kg), exceeding the CT1 criteria. No leach testing was undertaken for this material and as a result the preliminary classification is RSW.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

9. Discussion

Based on the decision-making process for assessing urban redevelopment sites detailed in DEC (2006) and discussed in **Section 6.1.2**, the decisions required to be made are discussed below.

9.1 Contaminant Distribution Summary

Sample results from the soil vapour assessment have indicated that there currently exists a significant chlorinated hydrocarbon impact within the vicinity of the dry cleaner (134-138 Henry Street). The volatile gas impact extends north of the dry cleaner, along the inferred groundwater flow direction, with exceedances of the soil vapour criteria for PCE and TCE identified from gas samples taken at probe locations SV04, SV05 and SV10 (**Figure 3C**). It is noted that the most significant concentrations were detected at location SV05, approximately in line with the inferred groundwater flow direction.

Groundwater and soil concentrations within the vicinity of the dry cleaner have also indicated the presence of chlorinated hydrocarbons, primarily PCE and TCE, albeit at concentrations which were below the adopted site assessment criteria. This has indicated that the impact has migrated laterally and vertically through soil and groundwater at the Site.

PCE and its degradation products, in their pure form, are dense non-aqueous phase liquids (DNAPLs). DNAPLs, once introduced to the environment, tend to sink until confined by a non-permeable barrier present within the local environmental system. It is considered likely that the shale bedrock layer has acted as a confining barrier and that the chlorinated hydrocarbon migration has been halted at approximately 11.5 – 12.0 m bgs, at the interface of the Nepean River gravels and shale bedrock. It is noted that no free phase non-aqueous liquids such as DNAPLs were detected during the GME.

It is noted that no well downstream of the impact was able to be installed due to the presence of building awnings/eaves along the northern boundary of the Site. It is considered possible that additional groundwater impact may be present at the Site that has yet to be identified.

Soil vapour analytical results indicated a minor detection of TRH at location SV04, west of the former service station. Given the lack of significant soil vapour concentrations for TRH within samples taken from the vicinity of the former service station, it is considered unlikely that a significant impact is present as a result of former, undocumented USTs or hydrocarbon spills.

9.2 Potential Risks to Future Onsite Receptors

The presence of chlorinated hydrocarbons in soil vapour represent a potential risk to current and future site users and will require remediation/management for the proposed land uses. The concentration of PCE within soil vapour at location SV05 and the concentration of both PCE and TCE exceeded the adopted HIL-C criteria; these exceedances represent a risk to future onsite receptors.

The concentration of PCE (0.059 mg/L) and toluene (0.094 mg/L) within groundwater sampled from location PSM01 exceeded the adopted drinking water criteria of 0.05 mg/L and 0.025 mg/L respectively. These concentrations represent an unacceptable risk to future onsite receptors.

Concentrations of COPC in all other samples analysed were reported to be at concentrations which did not indicate the presence of statistically significant exceedances of the adopted site assessment criteria.

Given the Site history, the presence of buried anthropogenic materials in the form of building and demolition waste and the identification of trace levels of asbestos within soil at location JB11, it is considered likely that ACM is present at other locations at the Site. Boreholes are limited in their utility for the identification of buried asbestos and ACM, therefore redevelopment of the Site may uncover additional, undocumented asbestos which could potentially represent a risk to human health.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

9.3 Background Soil Contamination

Metals concentrations within natural soil samples analysed were within published background ranges as detailed in **Section 6.2.1**.

9.4 Chemical Mixtures

Soil vapour samples analysed at locations SV04, SV05 and SV10 were reported to have concentrations of both PCE and TCE above the adopted site assessment criteria. The exposure pathway (inhalation) and physiological effects of these contaminants is similar and this may have compounding detrimental effects to the health of future site users.

There were no soil or groundwater samples analysed which indicated the presence of a chemical mixture requiring further consideration.

9.5 Aesthetic Issues

No visible ACM, odours, or stains were observed during the soil or soil vapour investigation.

9.6 Potential Migration of Contaminants

Based on the presence of significant chlorinated hydrocarbon concentrations in soil, groundwater and soil vapour there is potential that contaminant migration (particularly PCE and TCE in groundwater) from the Site is currently occurring. Primary migration is considered likely to be in the approximate direction of the groundwater flow, as indicated by the soil vapour results.

The lack of significant contaminant concentrations in any of the remaining soil, soil vapour or groundwater samples has indicated that the potential for off-site migration of contamination requiring management is low.

The source of elevated TRH concentrations in groundwater across the site is unclear. While the reported concentrations do not pose a risk to future site users additional works are required to identify the source of the contamination and whether there is potential for its migration from the site.

9.7 Site Management Strategy

Based on the proposed land use, the scope of work completed for this assessment and the limitations presented in **Section 11**, there are considered to be unacceptable risks at the Site which require management prior to utilization of the Site for the proposed land uses.

Management of impacts will be required within the vicinity of the dry cleaner and soil sampling location JHA02. A remedial action plan (RAP) will be required to be produced to identify the preferred remedial methodology.

Additionally, site management controls including protocols to manage unexpected finds should be implemented during any ground disturbance works associated with site development.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

10. Conclusions & Recommendations

In accordance with the limitations in **Section 11**, the following conclusions are provided.

- Soil vapour concentrations within the vicinity of the dry cleaner represent a potential risk to current and future site users which will require management prior to utilisation of the Site for the proposed land uses;
- Offsite migration of chlorinated hydrocarbons is potentially occurring, north of the dry cleaner along the inferred groundwater flow direction;
- Lead impacted fill material in the vicinity of JHA02 is required to be managed prior to the utilisation of the site for the proposed land uses;
- Asbestos and ACM may be present within surficial fill materials at the Site which has not been documented as part of this DSI. Boreholes are limited in their utility for the identification of buried asbestos and ACM. During the redevelopment stage of the works, additional asbestos may be identified which could potentially represent a risk to human health and will require management/remediation during redevelopment;
- Contaminants in soils and groundwater were generally not present at concentrations representing statistically significant exceedances of the Site assessment criteria, and therefore with the exception of the aforementioned, do not represent a risk to the current or futures site users;
- No background soil concentrations or aesthetic issues were identified in this assessment;
- The Site is currently unsuitable for the proposed land uses. Subject to the implementation of an RAP which manages the identified impacts, it is considered that the Site can be made suitable for the proposed land uses; and
- The reported concentrations of chlorinated hydrocarbons in groundwater/soil vapour exceed the relevant investigation levels presented in Schedule B1 of the *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPC 2013). As a result, there is a potential requirement for the site to be notified to the NSW EPA in accordance with the *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* (NSW EPA 2015).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

11. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the Site history. Further chemicals or categories of chemicals may exist at the Site, which were not identified in the Site history and which may not be expected at the Site.

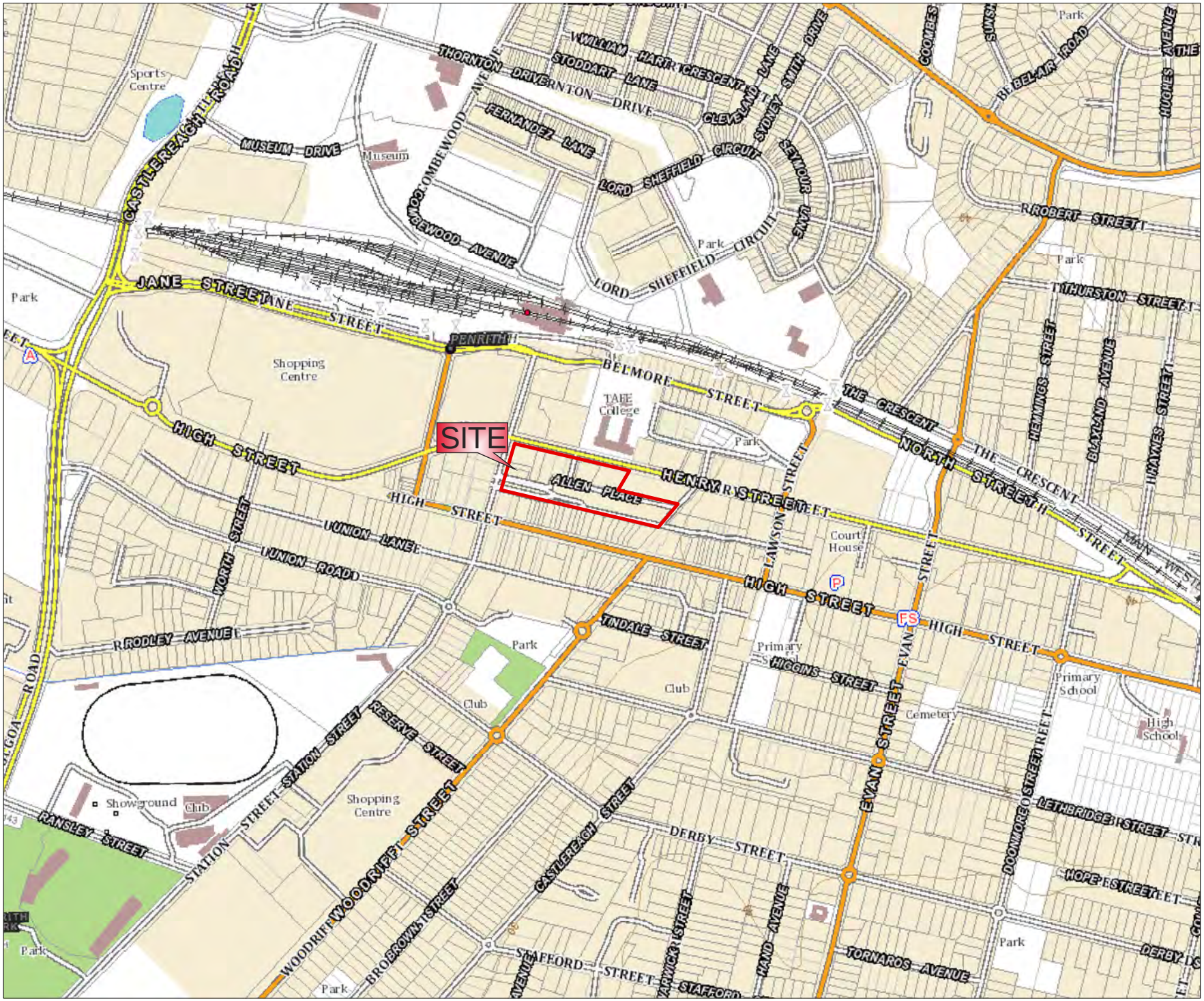
Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the Site, and it is limited to the scope defined herein. Should information become available regarding conditions at the Site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figures

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



Legend:

Approximate Site Boundary

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R01 Rev A	Date: 14-Jun-2017
Drawn By: SE	Checked By: KY

Scale 1:8,500

0 100 200

metres

Coor. Sys. GDA 1994 MGA Zone 56

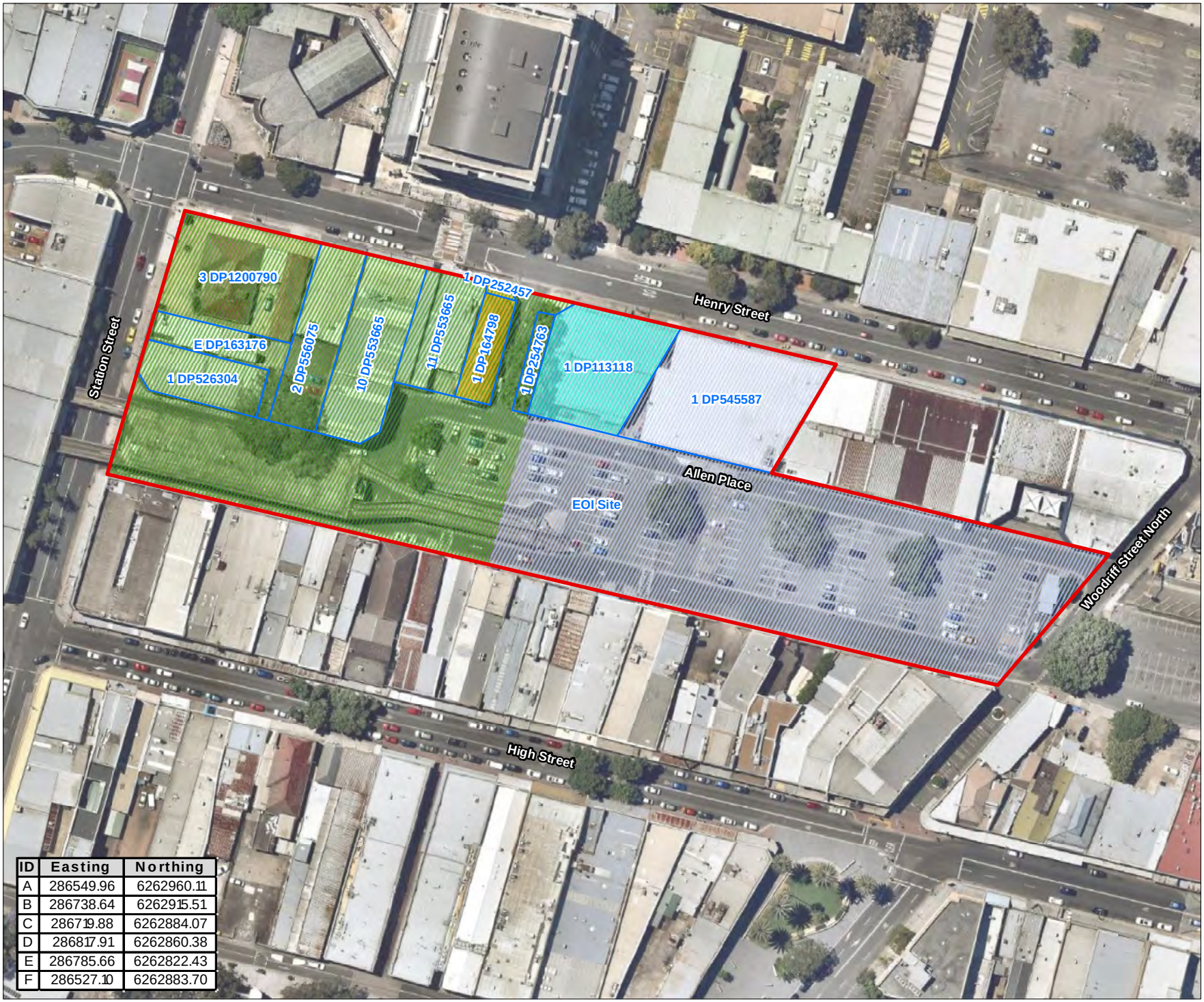
114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

SITE LOCATION

FIGURE 1

Reference: SIX Maps www.maps.six.nsw.gov.au, accessed 17-11-2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



ID	Easting	Northing
A	286549.96	6262960.11
B	286738.64	6262915.51
C	286719.88	6262884.07
D	286817.91	6262860.38
E	286785.66	6262822.43
F	286527.10	6262883.70

Reference: Near Map www.nearmap.com, imagery date 06-11-2016, accessed 17-11-2016

Legend:

- Approximate Site Boundary
- Approximate Lot Boundary
- Dry Cleaners Location
- Former Service Station Location
- Proposed Building Development Site
- Proposed Green Space

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R01 Rev A	Date: 04-Jul-2017
Drawn By: BC	Checked By: KY

Scale 1:1,500

0 10 20
metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

SITE LAYOUT CADASTRAL BOUNDARIES AND AECS

FIGURE 2

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Approximate Site Boundary
- Approximate Lot Boundary

Sample Location

- JBS&G Borehole
- JBS&G Hand Auger

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R01 Rev A	Date: 04-Jul-2017
Drawn By: BC	Checked By: RH

Scale 1:1,485

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

SOIL NVESTIGATION LOCATIONS & SOIL CRITERIA EXCEEDANCES

FIGURE 3A

Reference: Near Map www.nearmap.com, imagery date 06-11-2016, accessed 17-11-2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Reference: Near Map www.nearmap.com, imagery date 06-11-2016, accessed 17-11-2016

Legend:

- Approximate Site Boundary
- Approximate Lot Boundary

Sample Location

- PSM Well
- Inferred Groundwater Flow Direction

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R01 Rev A	Date: 04-Jul-2017
Drawn By: BC	Checked By: RH

Scale 1:1,485

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

GROUNDWATER MONITORING WELLS

FIGURE 3B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Approximate Site Boundary
- Approximate Lot Boundary

Sample Location

- JBS&G Soil Vapour

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R01 Rev A	Date: 04-Jul-2017
Drawn By: BC	Checked By: RH

Scale 1:1,485

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

SOIL VAPOUR PROBES & GAS CRITERIA EXCEEDANCES

FIGURE 3C

Reference: Near Map www.nearmap.com, imagery date 06-11-2016, accessed 17-11-2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table A(I): Soil Analytical Results (Health Criteria)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table A(1) - Soil Analytical Data (Health Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

| | Metals & Metalloids | | | | | | | | Chlorinated Alkanes | | | | | | | |

Table A(1) - Soil Analytical Data (Health Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

	Polycyclic Aromatic Hydrocarbons																				Monocyclic Aromatic Hydrocarbons					Miscellaneous Hydrocarbons						Chlorinated Benzenes					Solvents	Polychlorinated Biphenyls								Phenols	Organic Sulfur Compounds
	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (lower bound)*	Benzo(a)pyrene TEQ (medium bound)*	Benzo(a)pyrene TEQ (upper bound)*	Benzo(b,j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Carcinogenic PAHs as B(a)P TEQ	Phenanthrene	Pyrene	PAHs (Total)	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	Bromobenzene	Isopropylbenzene	Styrene	1,2-dibromoethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromomethane	Dibromomethane	Iodomethane	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Hexachlorobenzene	2-Propanone (Acetone)	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Total)	Phenols (Total)	Carbon disulfide
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	-	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.05	0.50	0.50	0.10	0.50	0.50	0.50	0.50	0.50	0.50	0.10	0.50
Natural Soils																																																
Background Concentrations Henry Olzworthy Et Al. 1995																																															
Proposed Green Spaces																																															
NEPM 2013 HSL Asbestos in Soil - FA & AF - HSL																																															
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Recreational - HSL C																																															
NEPM 2013 Soil HIL C																		3			300																10								1			
NEPM 2013 Soil HSL C for Vapour Intrusion - Clay 0 to <1m																	NL																														
Proposed Building Development and Green Spaces																																															
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Residential - HSL B																																															
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Recreational - HSL C																																															
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Commercial/Industrial - HSL D																																															
NEPM 2013 Soil HIL B																		4			400																15								1			
NEPM 2013 Soil HIL C																		3			300																10								1			
NEPM 2013 Soil HIL D																		40			4000																80								7			
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																	5																														
NEPM 2013 Soil HSL C for Vapour Intrusion - Clay 0 to <1m																	NL																														
NEPM 2013 Soil HSL D for Vapour Intrusion - Clay 0 to <1m																	NL																														
Proposed Green Spaces																																															
Sample ID	**Location**	**Sample Depth**	**Sample Date**	**Lithological Type**	**Lab Report**																																										
JB01_0.05-0.3	JB01	0.05-0.3	5/7/2017	Fill	545235	<0.5	<0.5	<0.5	0.6	0.7	0.9	1.2	1.5	0.8	0.7	0.5	0.7	<0.5	1.7	<0.5	<0.5	<0.5	1.179#2	0.6	1.7	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JB01_1.1-1.2	JB01	1.1-1.2	5/7/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB02_0.05-0.25	JB02	0.05-0.25	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB03_0.05-0.2	JB03	0.05-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB04_0.4-0.5	JB04	0.4-0.5	5/7/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<1.21#1	<0.5	0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	<0.1	<0.5
JB05_0.1-0.2	JB05	0.1-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB06_0.1-0.2	JB06	0.1-0.2	5/6/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	<0.1	<0.5
JB12_0.1-0.25	JB12	0.1-0.25	5/7/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#1	0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	<0.1	<0.5
JB12_1.1-1.2	JB12	1.1-1.2	5/7/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB13_0.1-0.2	JB13	0.1-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB14_0.1-0.3	JB14	0.1-0.3	5/7/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#1	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JB15-0.1-0.2	JB15	0.1-0.2	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	-	-
JB16_0.05-0.15	JB16	0.05-0.15	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	<0.5
JHA02_0.1-0.3	JHA02	0.1-0.3	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA02_0.3-0.5	JHA02	0.3-0.5	5/26/2017	Fill	548083	<0.5	<0.5	<0.5	0.8	0.9	1.2	1.5	1.7	0.7	0.7	0.8	1.1	<0.5	2.3	<0.5	0.6	<0.5	1.458#2	0.8	2.1	10.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JHA04_0.2-0.4	JHA04	0.2-0.4	5/26/2017	Fill	548083	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	<0.1	<0.5
JHA04_0.6-0.8	JHA04	0.6-0.8	5/26/2017	Natural	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	<0.5
JHA05_0-0.2	JHA05	0-0.2	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA07_0.4-0.6	JHA07	0.4-0.6	5/26/2017	Fill	548083	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
JHA07_1.3-1.5	JHA07	1.3-1.5	5/26/2017	Natural	548083	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	<0.1	<0.5
QC20170526-1	JHA07	1.3-1.5	5/26/2017	Natural	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	<0.5
Qc20170526-1A	JHA07	1.3-1.5	5/26/2017	Natural	168063	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA08_0.2-0.4	JHA08	0.2-0.4	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	-	-
JHA08_0.4-0.6	JHA08	0.4-0.6	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proposed Building Development and Green Spaces																																															
Sample ID	**Location**	**Sample Depth**	**Sample Date**	**Lithological Type**	**Lab Report**																																										
JB07_0.1-0.2	JB07	0.1-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	<0.5
JB08_0.1-0.2	JB08	0.1-0.2	5/6/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#1	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JB09_0.15-0.20	JB09	0.15-0.2	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20160506_2	JB09	0.15-0.2	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA20170506_2	JB09	0.15-0.2	5/6/2017	Fill	166525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB10_0.1-0.2	JB10	0.1-0.2	5/7/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#1	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JB11_0.05-0.15	JB11	0.05-0.15	5/6/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
JB11_0.35-0.45	JB11	0.35-0.45	5/6/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB17_0.1-0.25	JB17	0.1-0.25	5/7/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#1	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JB18_0.1-0.2	JB18	0.1-0.2	5/6/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
QC20160506_1	JB18	0.1-0.2	5/6/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
QA20170506_1	JB18	0.1-0.2	5/6/2017	Fill	166525	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.5	<0.5	-	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	<0.05	<1	<1	<1	<1	<1	<1	-	<1	<1	<1	<1	<1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<5	
JB19_0.3-0.4	JB19	0.3-0.4	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-	-	-	-	<0.5
JB19_1.6-1.7	JB19	1.6-1.7	5/6/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
JB20_0.5-0.6	JB20	0.5-0.6	5/6/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#1	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JB20_1.25-1.35	JB20	1.25-1.35	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB20_1.7-1.8	JB20	1.7-1.8	5/6/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	<1.21#1	<0.5	1	2.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
JB20_1.9-2.0	JB20	1.9-2	5/6/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA01_0.25-0.4	JHA01	0.25-0.4	5/26/2017	Fill	548083	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<1.21#1	<0.5	0.8	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JHA06_0.2-0.4	JHA06	0.2-0.4	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA06_0.4-0.6	JHA06	0.4-0.6	5/26/2017	Fill	548083	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#1	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JHA06_1.0-1.2	JHA06	1-1.2	5/26/2017	Fill	548083	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5

Data Comments

#1 ESDAT Combined. Some Analytes are missing from this Combined Compound.
#2 ESDAT Combined with Non-Detect Multiplier of 0.5.
#3 Synthetic mineral fibres detected.
#4 No respirable fibres detected
#5 Organic fibres detected.
#6 ESDAT Combined.
#7 Nil
#8 AF:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table A(1) - Soil Analytical Data (Health Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

	Organochlorine Pesticides																						Asbestos										Asbestos - Trace Analysis					
	4,4-DDE	Aldrin	Aldrin + Dieldrin (Sum of Total)	alpha-BHC	beta-BHC	Dieldrin	DDD	DDT	DDT+DDE+DDD (Sum of Total)	Chlordane	delta-BHC	Endosulfan alpha	Endosulfan beta	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Lindane	Methoxychlor	Toxaphene	Approx. Sample Mass	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Mass ACM	Mass Asbestos in ACM	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	ACM - Comment	AF - Comment	FA - Comment	Organic Fibres - Comment	Respirable Fibres - Comment	Synthetic Fibres - Comment
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	g	%w/w	%w/w	g	g	g	g	g	g	g	Comment	Comment	Comment	Comment	Comment	Comment
EQL	0.05	0.05		0.05	0.05	0.05	0.05	0.05		0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.20	1.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Natural Soils																																						
Background Concentrations Henry Olzworthy Et Al. 1995																																						
Proposed Green Spaces																																						
NEPM 2013 HSL Asbestos in Soil - FA & AF - HSL																									0.001													
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Recreational - HSL C																								0.02														
NEPM 2013 Soil HIL C			10						400	70					20			10			400	30																
NEPM 2013 Soil HSL C for Vapour Intrusion - Clay 0 to <1m																																						
Proposed Building Development and Green Spaces																																						
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Residential - HSL B																								0.04														
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Recreational - HSL C																								0.02														
NEPM 2013 HSL Asbestos in Soil - Bonded ACM - Commercial/Industrial - HSL D																								0.05														
NEPM 2013 Soil HIL B			10						600	90					20			10			500	30																
NEPM 2013 Soil HIL C			10						400	70					20			10			400	30																
NEPM 2013 Soil HIL D			45						3600	530					100			50			2500	160																
NEPM 2013 Soil HSL A & HSL B for Vapour Intrusion - Clay 0 to <1m																																						
NEPM 2013 Soil HSL C for Vapour Intrusion - Clay 0 to <1m																																						
NEPM 2013 Soil HSL D for Vapour Intrusion - Clay 0 to <1m																																						

Proposed Green Spaces																																						
Sample ID	**Location**	**Sample Depth**	**Sample Date**	**Lithological Type**	**Lab Report**																																		
JB01_0.05-0.3	JB01	0.05-0.3	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	496	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JB01_1.1-1.2	JB01	1.1-1.2	5/7/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB02_0.05-0.25	JB02	0.05-0.25	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB03_0.05-0.2	JB03	0.05-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB04_0.4-0.5	JB04	0.4-0.5	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	818	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JB05_0.1-0.2	JB05	0.1-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB06_0.1-0.2	JB06	0.1-0.2	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	555	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JB12_0.1-0.25	JB12	0.1-0.25	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	827	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JB12_1.1-1.2	JB12	1.1-1.2	5/7/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB13_0.1-0.2	JB13	0.1-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB14_0.1-0.3	JB14	0.1-0.3	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	956	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JB15-0.1-0.2	JB15	0.1-0.2	5/6/2017	Fill	545235	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB16_0.05-0.15	JB16	0.05-0.15	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA02_0.1-0.3	JHA02	0.1-0.3	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA02_0.3-0.5	JHA02	0.3-0.5	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	577	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JHA04_0.2-0.4	JHA04	0.2-0.4	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	653	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JHA04_0.6-0.8	JHA04	0.6-0.8	5/26/2017	Natural	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA05_0-0.2	JHA05	0-0.2	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA07_0.4-0.6	JHA07	0.4-0.6	5/26/2017	Fill	548083	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	764	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JHA07_1.3-1.5	JHA07	1.3-1.5	5/26/2017	Natural	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20170526-1	JHA07	1.3-1.5	5/26/2017	Natural	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Qc20170526-1A	JHA07	1.3-1.5	5/26/2017	Natural	168063	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA08_0.2-0.4	JHA08	0.2-0.4	5/26/2017	Fill	548083	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	635	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JHA08_0.4-0.6	JHA08	0.4-0.6	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proposed Building Development and Green Spaces																																						
Sample ID	**Location**	**Sample Depth**	**Sample Date**	**Lithological Type**	**Lab Report**																																		
JB07_0.1-0.2	JB07	0.1-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB08_0.1-0.2	JB08	0.1-0.2	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	606	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JB09_0.15-0.20	JB09	0.15-0.2	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20160506_2	JB09	0.15-0.2	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA20170506_2	JB09	0.15-0.2	5/6/2017	Fill	166525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB10_0.1-0.2	JB10	0.1-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	754	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JB11_0.05-0.15	JB11	0.05-0.15	5/6/2017	Fill	545235	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	641	0	0.0006	0	0	0	0	0.0332	0.004	0.004	[#7]	[#8]	[#7]	[#5]	[#4]	[#3]
JB11_0.35-0.45	JB11	0.35-0.45	5/6/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB17_0.1-0.25	JB17	0.1-0.25	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	806	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JB18_0.1-0.2	JB18	0.1-0.2	5/6/2017	Fill	545235	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	506	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
QC20160506_1	JB18	0.1-0.2	5/6/2017	Fill	545235	<0.05	<0.05	<0.1#6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15#1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	752	0	0	0	0	0	0	0	0	0	1#7	1#7	1#7	1#5	1#4	1#7
QA20170506_1	JB18	0.1-0.2	5/6/2017	Fill	166525	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	<0.1	<0.1	-	<0.1	-	528	0	0	0	0	0	0	0	0	0	1#7	1#7	1#7	1#5	1#4	1#7
JB19_0.3-0.4	JB19	0.3-0.4	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB19_1.6-1.7	JB19	1.6-1.7	5/6/2017	Fill	545235	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	400	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JB20_0.5-0.6	JB20	0.5-0.6	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	707	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JB20_1.25-1.35	JB20	1.25-1.35	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB20_1.7-1.8	JB20	1.7-1.8	5/6/2017	Fill	545235	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	208	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JB20_1.9-2.0	JB20	1.9-2	5/6/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA01_0.25-0.4	JHA01	0.25-0.4	5/26/2017	Fill	548083	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	756	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JHA06_0.2-0.4	JHA06	0.2-0.4	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA06_0.4-0.6	JHA06	0.4-0.6	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	617	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]
JHA06_1.0-1.2	JHA06	1-1.2	5/26/2017	Fill	548083	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	605	0	0	0	0	0	0	0	0	0	[#7]	[#7]	[#7]	[#5]	[#4]	[#7]

Data Comments

#1 ESDAT Combined. Some Analytes are missing from this Combined Compound.
#2 ESDAT Combined with Non-Detect Multiplier of 0.5.
#3 Synthetic mineral fibres detected.
#4 No respirable fibres detected
#5 Organic fibres detected.
#6 ESDAT Combined.
#7 Nil
#8 AF:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table A(II): Soil Analytical Results (Ecological Criteria)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table A(2) - Soil Analytical Results (Ecological Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

	Metals & Metalloids								Chlorinated Alkanes																Chlorinated Alkenes												Trihalomethanes				TPHs (NEPC 1999)					TRHs (NEPC 2013)						BTEX					
	Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	Bromochloromethane	Carbon tetrachloride	Chloroethane	Chloromethane	Dichlorodifluoromethane	Dichloromethane	Trichlorofluoromethane	1,1-dichloroethene	3-chloropropene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	>C10-C16 less Naphthalene (F2)	C6-C10 Fraction	C6-C10 less BTEX (F1)	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	2.00	0.40	5.00	5.00	5.00	0.10	5.00	5.00	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	20.00	20.00	50.00	50.00	50.00	50.00	100.00	100.00	50.00	20.00	20.00	0.10	0.10	0.10	0.10	0.20	0.30
Proposed Green Spaces																																																									
NEPC 2013 EIL, EILs Aged Sediment (Residential, Parkland and Public Open Space)	100			179	1403		176	412																																																
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil																																																120	1300	5600	120	180	180	65	125	105			45
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Fine																																															1000	3500	10000		800							
Proposed Building Development and Green Spaces																																																						
NEPC 2013 EIL, EILs Aged Sediment (Residential, Parkland and Public Open Space)	100			179	1403		176	412																																														
NEPC 2013 EIL, EILs Aged Sediment (Commercial and Industrial)	160			239	2103		296	562																																														
NEPM 2013 ESL Commercial and Industrial, Fine Soil																																															170	2500	6600	170	215	215	95	185	135			95
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Fine																																															1000	3500	10000		800							
NEPM 2013 Mgnt Limits - Commercial and Industrial, Fine																																															1000	5000	10000		800							
Proposed Green Spaces																																																						
Sample ID	**Location**	**Sample Depth**	**Sample Date**	**Lithological Type**	**Lab Report**																																																			
JB01_0.05-0.3	JB01	0.05-0.3	5/7/2017	Fill	545235	12	<0.4	14	17	110	0.2	7.3	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JB01_1.1-1.2	JB01	1.1-1.2	5/7/2017	Natural	545235	3.4	<0.4	9.9	17	6.2	<0.1	<5	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB02_0.05-0.25	JB02	0.05-0.25	5/7/2017	Fill	545235	12	<0.4	7.3	13	87	0.1	5.2	180	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB03_0.05-0.2	JB03	0.05-0.2	5/7/2017	Fill	545235	2.9	<0.4	7.7	7.3	120	<0.1	<5	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB04_0.4-0.5	JB04	0.4-0.5	5/7/2017	Fill	545235	3.8	<0.4	9.7	24	110	<0.1	7.2	110	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JB05_0.1-0.2	JB05	0.1-0.2	5/7/2017	Fill	545235	9	<0.4	21	42	120	0.2	27	170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB06_0.1-0.2	JB06	0.1-0.2	5/6/2017	Fill	545235	8.9	<0.4	69	<5	13	<0.1	<5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JB12_0.1-0.25	JB12	0.1-0.25	5/7/2017	Fill	545235	<2	<0.4	91	24	<5	<0.1	75	48	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	87	69	156	<50	120	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JB12_1.1-1.2	JB12	1.1-1.2	5/7/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB13_0.1-0.2	JB13	0.1-0.2	5/7/2017	Fill	545235	5.6	<0.4	13	12	25	<0.1	6.4	170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB14_0.1-0.3	JB14	0.1-0.3	5/7/2017	Fill	545235	5	0.8	18	61	57	0.3	14	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JB15-0.1-0.2	JB15	0.1-0.2	5/6/2017	Fill	545235	13	<0.4	110	5.9	16	<0.1	<5	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB16_0.05-0.15	JB16	0.05-0.15	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JHA02_0.1-0.3	JHA02	0.1-0.3	5/26/2017	Fill	548083	50	0.5	11	230	430	0.3	8.8	290	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA02_0.3-0.5	JHA02	0.3-0.5	5/26/2017	Fill	548083	49	0.5	12	200	910	0.4	8.7	340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	23	<50	<50	<50	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JHA04_0.2-0.4	JHA04	0.2-0.4	5/26/2017	Fill	548083	2.7	<0.4	53	19	7	<0.1	58	38	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JHA04_0.6-0.8	JHA04	0.6-0.8	5/26/2017	Natural	548083	8.4	<0.4	16	21	27	<0.1	14	25	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JHA05_0-0.2	JHA05	0-0.2	5/26/2017	Fill	548083	4.4	<0.4	24	15	39	<0.1	22	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA07_0.4-0.6	JHA07	0.4-0.6	5/26/2017	Fill	548083	<2	<0.4	<5	<5	<5	<0.1	<5	14	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JHA07_1.3-1.5	JHA07	1.3-1.5	5/26/2017	Natural	548083	7	<0.4	11	19	12	<0.1	<5	18	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
QC20170526-1	JHA07	1.3-1.5	5/26/2017	Natural	548083	2.9	<0.4	8	9.8	8.3	<0.1	<5	12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
Qc20170526-1A	JHA07	1.3-1.5	5/26/2017	Natural	168063	<4	<0.4	12	16	9	<0.1	5	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA08_0.2-0.4	JHA08	0.2-0.4	5/26/2017	Fill	548083	5.1	<0.4	13	15	28	<0.1	13	310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA08_0.4-0.6	JHA08	0.4-0.6	5/26/2017	Fill	548083	2.6	<0.4	5.9	8.4	8.2	<0.1	<5	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proposed Building Development and Green Spaces																																																			
Sample ID	**Location**	**Sample Depth**	**Sample Date**	**Lithological Type**	**Lab Report**																																																	
JB07_0.1-0.2	JB07	0.1-0.2	5/7/2017	Fill	545235	7.8	<0.4	64	17	29	0.4	34	57	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JB08_0.1-0.2	JB08	0.1-0.2	5/6/2017	Fill	545235	3.9	<0.4	17	<5	6.5	<0.1	<5	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JB09_0.15-0.20	JB09	0.15-0.2	5/6/2017	Fill	545235	10	<0.4	46	28	15	<0.1	<5	7.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20160506_2	JB09	0.15-0.2	5/6/2017	Fill	545235	8.1	<0.4	42	16	20	<0.1	<5	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA20170506_2	JB09	0.15-0.2	5/6/2017	Fill	166525	6	<0.4	32	15	14	<0.1	4	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB10_0.1-0.2	JB10	0.1-0.2	5/7/2017	Fill	545235	8.8	<0.4	44	6.9	10	<0.1	<5	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JB11_0.05-0.15	JB11	0.05-0.15	5/6/2017	Fill	545235	2.7	<0.4	6.3	23	31	<0.1	<5	93	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	39	480	350	869	51	710	140	51	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JB11_0.35-0.45	JB11	0.35-0.45	5/6/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB17_0.1-0.25	JB17	0.1-0.25	5/7/2017	Fill	545235	10	<0.4	64	<5	13	<0.1	<5	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	58	58	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JB18_0.1-0.2	JB18	0.1-0.2	5/6/2017	Fill	545235	7.5	<0.4	39	6.2	12	<0.1	<5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
QC20160506_1	JB13	0.1-0.2	5/6/2017	Fill	545235	8.6	<0.4	50	<5	12	<0.1	<5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
QA20170506_1	JB13	0.1-0.2	5/6/2017	Fill	166525	4	<0.4	38	5	8	<0.1	2	3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<25	<50	<100	<100	<25	<50	<100	<100	<50	<25	<25	<0.2	<1	<0.5	<1	<2	<1
JB19_0.3-0.4	JB19	0.3-0.4	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JB19_1.6-1.7	JB19	1.6-1.7	5/6/2017	Fill	545235	5	<0.4	10	5.3	5.5	<0.1	5.4	29	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JB20_0.5-0.6	JB20	0.5-0.6	5/6/2017	Fill	545235	2.7	<0.4	10	<5	8	<0.1	<5	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JB20_1.25-1.35	JB20	1.25-1.35	5/6/2017	Fill	545235	4.6	0.4	12	25	49	0.1	7.7	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB20_1.7-1.8	JB20	1.7-1.8	5/6/2017	Fill	545235	4.4	<0.4	9.2	31	110	0.3	5.8	190	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	69	58	127	<50	110	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JB20_1.9-2.0	JB20	1.9-2	5/6/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA01_0.25-0.4	JHA01	0.25-0.4	5/26/2017	Fill	548083	3.9	<0.4	21	11	6.8	<0.1	25	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JHA06_0.2-0.4	JHA06	0.2-0.4	5/26/2017	Fill	548083	2.2	<0.4	8	8.9	15	<0.1	6.8	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA06_0.4-0.6	JHA06	0.4-0.6	5/26/2017	Fill	548083	6.4	<0.4	14	20	37	<0.1	11	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	74	74	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3
JHA06_1.0-1.2	JHA06	1-1.2	5/26/2017	Fill	548083	6.9	<0.4	11	17	27	<0.1	13	50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	55	55	<50	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3

#1 ESDAT Combined. Some Analytes are missing from this Combined Compound.
#2 ESDAT Combined with Non-Detect Multiplier of 0.5.
#3 Synthetic mineral fibres detected.
#4 No respirable fibres detected
#5 Organic fibres detected.
#6 ESDAT Combined.
#7 Nil
#8 AF:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table A(2) - Soil Analytical Results (Ecological Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

	Polycyclic Aromatic Hydrocarbons																				Monocyclic Aromatic Hydrocarbons					Miscellaneous Hydrocarbons						Chlorinated Benzenes					Solvents	Polychlorinated Biphenyls								Phenols	Organic Sulfur Compounds
	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (lower bound)*	Benzo(a)pyrene TEQ (medium bound)*	Benzo(a)pyrene TEQ (upper bound)*	Benzo(b,j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Carcinogenic PAHs as B(a)P TEQ	Phenanthrene	Pyrene	PAHs (Total)	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	Bromobenzene	Isopropylbenzene	Styrene	1,2-dibromoethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromomethane	Dibromomethane	Iodomethane	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Hexachlorobenzene	2-Propanone (Acetone)	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Total)	Phenols (Total)	Carbon disulfide
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50		0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.05	0.50	0.50	0.10	0.50	0.50	0.50	0.50	0.50	0.50	0.10	0.50
Proposed Green Spaces																																															
NEPC 2013 EIL, EILs Aged Sediment (Residential, Parkland and Public Open Space)																	170																														
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil					0.7																																										
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Fine																																															
Proposed Building Development and Green Spaces																																															
NEPC 2013 EIL, EILs Aged Sediment (Residential, Parkland and Public Open Space)																	170																														
NEPC 2013 EIL, EILs Aged Sediment (Commercial and Industrial)																																															
NEPM 2013 ESL Commercial and Industrial, Fine Soil					1.4																																										
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Fine																																															
NEPM 2013 Mgnt Limits - Commercial and Industrial, Fine																																															

Proposed Green Spaces																																																	
Sample ID	**Location**	**Sample Depth**	**Sample Date**	**Lithological Type**	**Lab Report**																																												
JB01_0.05-0.3	JB01	0.05-0.3	5/7/2017	Fill	545235	<0.5	<0.5	<0.5	0.6	0.7	0.9	1.2	1.5	0.8	0.7	0.5	0.7	<0.5	1.7	<0.5	<0.5	<0.5	1.179[#2]	0.6	1.7	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JB01_1.1-1.2	JB01	1.1-1.2	5/7/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB02_0.05-0.25	JB02	0.05-0.25	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB03_0.05-0.2	JB03	0.05-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB04_0.4-0.5	JB04	0.4-0.5	5/7/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-	-	-	<0.1	<0.5
JB05_0.1-0.2	JB05	0.1-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB06_0.1-0.2	JB06	0.1-0.2	5/6/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-	-	-	<0.1	<0.5
JB12_0.1-0.25	JB12	0.1-0.25	5/7/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#6]	0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-	-	-	<0.1	<0.5
JB12_1.1-1.2	JB12	1.1-1.2	5/7/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB13_0.1-0.2	JB13	0.1-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB14_0.1-0.3	JB14	0.1-0.3	5/7/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JB15-0.1-0.2	JB15	0.1-0.2	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-
JB16_0.05-0.15	JB16	0.05-0.15	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-	-	-	-	<0.5
JHA02_0.1-0.3	JHA02	0.1-0.3	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA02_0.3-0.5	JHA02	0.3-0.5	5/26/2017	Fill	548083	<0.5	<0.5	<0.5	0.8	0.9	1.2	1.5	1.7	0.7	0.7	0.8	1.1	<0.5	2.3	<0.5	0.6	<0.5	1.458[#2]	0.8	2.1	10.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JHA04_0.2-0.4	JHA04	0.2-0.4	5/26/2017	Fill	548083	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-	-	-	<0.1	<0.5
JHA04_0.6-0.8	JHA04	0.6-0.8	5/26/2017	Natural	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-	-	-	-	<0.5
JHA05_0-0.2	JHA05	0-0.2	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA07_0.4-0.6	JHA07	0.4-0.6	5/26/2017	Fill	548083	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
JHA07_1.3-1.5	JHA07	1.3-1.5	5/26/2017	Natural	548083	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-	-	-	<0.1	<0.5
QC20170526-1	JHA07	1.3-1.5	5/26/2017	Natural	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-	-	-	-	<0.5
Qc20170526-1A	JHA07	1.3-1.5	5/26/2017	Natural	168063	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA08_0.2-0.4	JHA08	0.2-0.4	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-
JHA08_0.4-0.6	JHA08	0.4-0.6	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Proposed Building Development and Green Spaces																																																
Sample ID	**Location**	**Sample Depth**	**Sample Date**	**Lithological Type**	**Lab Report**																																												
JB07_0.1-0.2	JB07	0.1-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-	-	-	-	<0.5
JB08_0.1-0.2	JB08	0.1-0.2	5/6/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JB09_0.15-0.20	JB09	0.15-0.2	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20160506_2	JB09	0.15-0.2	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA20170506_2	JB09	0.15-0.2	5/6/2017	Fill	166525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB10_0.1-0.2	JB10	0.1-0.2	5/7/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JB11_0.05-0.15	JB11	0.05-0.15	5/6/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
JB11_0.35-0.45	JB11	0.35-0.45	5/6/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB17_0.1-0.25	JB17	0.1-0.25	5/7/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JB18_0.1-0.2	JB18	0.1-0.2	5/6/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
QC20160506_1	JB13	0.1-0.2	5/6/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21#6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
QA20170506_1	JB13	0.1-0.2	5/6/2017	Fill	166525	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1.21[#6]	<0.1	<0.1	<0.05	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-
JB19_0.3-0.4	JB19	0.3-0.4	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-	-	-	-	<0.5
JB19_1.6-1.7	JB19	1.6-1.7	5/6/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
JB20_0.5-0.6	JB20	0.5-0.6	5/6/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JB20_1.25-1.35	JB20	1.25-1.35	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB20_1.7-1.8	JB20	1.7-1.8	5/6/2017	Fill	545235	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	1	2.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5
JB20_1.9-2.0	JB20	1.9-2	5/6/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA01_0.25-0.4	JHA01	0.25-0.4	5/26/2017	Fill	548083	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	0.8	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JHA06_0.2-0.4	JHA06	0.2-0.4	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA06_0.4-0.6	JHA06	0.4-0.6	5/26/2017	Fill	548083	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.1	-
JHA06_1.0-1.2	JHA06	1-1.2	5/26/2017	Fill	548083	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#6]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5

#1 ESDAT Combined. Some Analytes are missing from this Combined Compound.
#2 ESDAT Combined with Non-Detect Multiplier of 0.5.
#3 Synthetic mineral fibres detected.
#4 No respirable fibres detected
#5 Organic fibres detected.
#6 ESDAT Combined.
#7 Nil
#8 AF:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table A(2) - Soil Analytical Results (Ecological Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

	Organochlorine Pesticides																						Ionic Balance			Asbestos										Asbestos - Trace Analysis						Other
	4,4-DDE	Aldrin	Aldrin + Dieldrin (Sum of Total)	alpha-BHC	beta-BHC	Dieldrin	DDD	DDT	DDT+DDE+DDD (Sum of Total)	Chlordane	delta-BHC	Endosulfan alpha	Endosulfan beta	Endosulfan sulphate	Endrin	Endrin aldehyde	Endrin ketone	Heptachlor	Heptachlor Epoxide	Lindane	Methoxychlor	Toxaphene	Cation Exchange Capacity	EC 1:5 soilwater	pH 1:5 soilwater	Approx. Sample Mass	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Mass ACM	Mass Asbestos in ACM	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	ACM - Comment	AF - Comment	FA - Comment	Organic Fibres - Comment	Respirable Fibres - Comment	Synthetic Fibres - Comment	% Clay
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	meq/100g	µS/cm	ph Units	g	%w/w	%w/w	g	g	g	g	g	g	g	Comment	Comment	Comment	Comment	Comment	Comment	%
EQL	0.05	0.05		0.05	0.05	0.05	0.05	0.05		0.10	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.20	1.00	0.05	10.00	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.00
Proposed Green Spaces																																										
NEPC 2013 EIL, EILs Aged Sediment (Residential, Parkland and Public Open Space)								180																																		
NEPM 2013 ESL Urban Residential and Public Open Space, Fine Soil																																										
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Fine																																										
Proposed Building Development and Green Spaces																																										
NEPC 2013 EIL, EILs Aged Sediment (Residential, Parkland and Public Open Space)								180																																		
NEPC 2013 EIL, EILs Aged Sediment (Commercial and Industrial)																																										
NEPM 2013 ESL Commercial and Industrial, Fine Soil																																										
NEPM 2013 Mgnt Limits - Residential, Parkland and Public Open Space, Fine																																										
NEPM 2013 Mgnt Limits - Commercial and Industrial, Fine																																										
Proposed Green Spaces																																										
Sample ID	**Location**	**Sample Depth**	**Sample Date**	**Lithological Type**	**Lab Report**																																						
JB01_0.05-0.3	JB01	0.05-0.3	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	496	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JB01_1.1-1.2	JB01	1.1-1.2	5/7/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	460	5.6	-	-	-	-	-	-	-	-	-	-	-	-	-	43
JB02_0.05-0.25	JB02	0.05-0.25	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB03_0.05-0.2	JB03	0.05-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB04_0.4-0.5	JB04	0.4-0.5	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	818	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JB05_0.1-0.2	JB05	0.1-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB06_0.1-0.2	JB06	0.1-0.2	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	555	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JB12_0.1-0.25	JB12	0.1-0.25	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	827	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JB12_1.1-1.2	JB12	1.1-1.2	5/7/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	130	7.7	-	-	-	-	-	-	-	-	-	-	-	-	-	39
JB13_0.1-0.2	JB13	0.1-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB14_0.1-0.3	JB14	0.1-0.3	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	956	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JB15-0.1-0.2	JB15	0.1-0.2	5/6/2017	Fill	545235	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB16_0.05-0.15	JB16	0.05-0.15	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA02_0.1-0.3	JHA02	0.1-0.3	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA02_0.3-0.5	JHA02	0.3-0.5	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	577	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JHA04_0.2-0.4	JHA04	0.2-0.4	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	653	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JHA04_0.6-0.8	JHA04	0.6-0.8	5/26/2017	Natural	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA05_0-0.2	JHA05	0-0.2	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA07_0.4-0.6	JHA07	0.4-0.6	5/26/2017	Fill	548083	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	764	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JHA07_1.3-1.5	JHA07	1.3-1.5	5/26/2017	Natural	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20170526-1	JHA07	1.3-1.5	5/26/2017	Natural	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Qc20170526-1A	JHA07	1.3-1.5	5/26/2017	Natural	168063	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA08_0.2-0.4	JHA08	0.2-0.4	5/26/2017	Fill	548083	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	635	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JHA08_0.4-0.6	JHA08	0.4-0.6	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Proposed Building Development and Green Spaces																																										
Sample ID	**Location**	**Sample Depth**	**Sample Date**	**Lithological Type**	**Lab Report**																																						
JB07_0.1-0.2	JB07	0.1-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB08_0.1-0.2	JB08	0.1-0.2	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	606	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JB09_0.15-0.20	JB09	0.15-0.2	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20160506_2	JB09	0.15-0.2	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA20170506_2	JB09	0.15-0.2	5/6/2017	Fill	166525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB10_0.1-0.2	JB10	0.1-0.2	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	754	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JB11_0.05-0.15	JB11	0.05-0.15	5/6/2017	Fill	545235	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	641	0	0.0006	0	0	0	0	0.0332	0.004	0.004	1[#7]	1[#8]	1[#7]	1[#5]	1[#4]	1[#5]	-
JB11_0.35-0.45	JB11	0.35-0.45	5/6/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17	170	8.3	-	-	-	-	-	-	-	-	-	-	-	-	-	28
JB17_0.1-0.25	JB17	0.1-0.25	5/7/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	806	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JB18_0.1-0.2	JB18	0.1-0.2	5/6/2017	Fill	545235	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	506	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
QC20160506_1	JB13	0.1-0.2	5/6/2017	Fill	545235	<0.05	<0.05	<0.1#6	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15#1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	752	0	0	0	0	0	0	0	0	0	1#7	1#7	1#7	1#5	1#4	1#7	-
QA20170506_1	JB13	0.1-0.2	5/6/2017	Fill	166525	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	528	0	0	0	0	0	0	0	0	0	1#7	1#7	1#7	1#5	1#4	1#7	-
JB19_0.3-0.4	JB19	0.3-0.4	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB19_1.6-1.7	JB19	1.6-1.7	5/6/2017	Fill	545235	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	400	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JB20_0.5-0.6	JB20	0.5-0.6	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	707	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JB20_1.25-1.35	JB20	1.25-1.35	5/6/2017	Fill	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB20_1.7-1.8	JB20	1.7-1.8	5/6/2017	Fill	545235	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	208	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JB20_1.9-2.0	JB20	1.9-2	5/6/2017	Natural	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20	110	7.6	-	-	-	-	-	-	-	-	-	-	-	-	-	30
JHA01_0.25-0.4	JHA01	0.25-0.4	5/26/2017	Fill	548083	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	756	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JHA06_0.2-0.4	JHA06	0.2-0.4	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA06_0.4-0.6	JHA06	0.4-0.6	5/26/2017	Fill	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	617	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-
JHA06_1.0-1.2	JHA06	1-1.2	5/26/2017	Fill	548083	<0.05	<0.05	<0.1[#6]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.15[#1]	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	<1	-	-	-	605	0	0	0	0	0	0	0	0	0	1[#7]	1[#7]	1[#7]	1[#5]	1[#4]	1[#7]	-

#1 ESDAT Combined. Some Analytes are missing from this Combined Compound.
#2 ESDAT Combined with Non-Detect Multiplier of 0.5.
#3 Synthetic mineral fibres detected.
#4 No respirable fibres detected
#5 Organic fibres detected.
#6 ESDAT Combined.
#7 Nil
#8 AF:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table B(I): Groundwater Analytical Results

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table B(1) - Groundwater Analytical Results
Project Number: 52372
Project Name: Penrith Central Car Park

	Metals & Metalloids								Chlorinated Alkanes																Chlorinated Alkenes										Trihalomethanes				TPHs (NEPC 1999)					TRHs (NEPC 2013)						BTEX					
	Arsenic (Total) (Filtered)	Cadmium (Filtered)	Chromium (Total) (Filtered)	Copper (Filtered)	Lead (Filtered)	Mercury (Inorganic) (Filtered)	Nickel (Filtered)	Zinc (Filtered)	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	Bromochloromethane	Carbon tetrachloride	Chloroethane	Chloromethane	Dichlorodifluoromethane	Dichloromethane	Trichlorofluoromethane	1,1-dichloroethene	β-chloropropene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	>C10-C16 less Naphthalene (F2)	C6-C10 Fraction	C6-C10 less BTEX (F1)	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.10	0.10	0.10	0.05	0.10	0.10	0.05	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
ANZECC 2000 Fresh Water 95 %	0.013	0.0002	0.001	0.0014	0.0034	0.0006	0.011	0.008				6.5																																			0.95			0.35		0.55
NWQMS 2011 (November 2016) - Aesthetic				1				3																																										0.003	0.025				0.02
NWQMS 2011 (November 2016) - Health	0.01	0.002		2	0.01	0.001	0.02								0.003				0.003				0.004		0.03				0.05			0.02	0.0003	0.25	0.25	0.25	0.25										0.001	0.3	0.8			0.6
NWQMS 2011 (as Amended November 2016) (Factor 10) Aesthetics				10				30																																										0.03	0.25				0.2
NWQMS 2011 (as Amended November 2016) (Factor 10) Health	0.1	0.02		20	0.1	0.01	0.2								0.03				0.03				0.04		0.3				0.5			0.2	0.003	2.5	2.5	2.5	2.5										0.01	3	8			6
NEPM Groundwater HSL (A&B) for Vapour Intrusion 4 m to 8 m (Clay)																																																	5	NL	NL			NL
NEPM Groundwater HSL (C) for Vapour Intrusion 4 m to 8 m (Clay)																																																	NL	NL	NL			NL
NEPM Groundwater HSL (D) for Vapour Intrusion 4 m to 8 m (Clay)																																																	30	NL	NL			NL

| Sample Name | Sampled Date | Depth | Lab Report Number | | | | | | | | | | | | | | | | | | |

Table B(1) - Groundwater Analytical Results
Project Number: 52372
Project Name: Penrith Central Car Park

	Polycyclic Aromatic Hydrocarbons																Monocyclic Aromatic Hydrocarbons					Miscellaneous Hydrocarbons						Chlorinated Benzenes				Solvents	Organic Sulfur Compounds	Miscellaneous Industrial Chemicals
	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b,j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Total)	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	Bromobenzene	Isopropylbenzene	Styrene	1,2-dibromoethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromomethane	Dibromomethane	Iodomethane	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	2-Propanone (Acetone)	Carbon disulfide	Hexachlorobutadiene
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L
EQL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	
ANZECC 2000 Fresh Water 95 %														0.016															0.16	0.26	0.06				
NWQMS 2011 (November 2016) - Aesthetic																						0.004							0.001	0.02	0.003	0.01			
NWQMS 2011 (November 2016) - Health					0.00001																	0.03	0.001			0.001			1.5		0.04	0.3			0.0007
NWQMS 2011 (as Amended November 2016) (Factor 10) Aesthetics																						0.04							0.01	0.2	0.03	0.1			
NWQMS 2011 (as Amended November 2016) (Factor 10) Health					0.0001																	0.3	0.01			0.01			15		0.4	3			0.007
NEPM Groundwater HSL (A&B) for Vapour Intrusion 4 m to 8 m (Clay)														NL																					
NEPM Groundwater HSL (C) for Vapour Intrusion 4 m to 8 m (Clay)														NL																					
NEPM Groundwater HSL (D) for Vapour Intrusion 4 m to 8 m (Clay)														NL																					
Sample Name	**Sampled Date**	**Depth**	**Lab Report Number**																																
PSM01	5/26/2017	6.96	548083	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00014	0.00008	<0.00005	0.00022	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	21	<0.001	-
QC01_W	5/26/2017	6.96	548083	<0.00005	<0.00005	<0.00005	<0.00005	0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.0002	0.00005	<0.00005	0.00026	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	21	<0.001	-
QC01-W/A	5/26/2017	6.96	168063	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	g[1]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.01	<0.001	-	<0.001	<0.001	<0.001	-	-	<0.001
PSM02	5/26/2017	6.95	548083	<0.00005	<0.00005	<0.00005	<0.00005	0.00001	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00014	0.00007	<0.00005	0.00027	0.003	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.001	-
PSM03	5/26/2017	8.01	548083	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00009	<0.00005	<0.00005	0.00009	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<1	<0.001	-

Data Comments

#1 NIL (+)VE

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table C(I): Soil Vapour Analytical results

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table C(1) - Soil Vapour
Project Number: 52372
Project Name: Penrith Central Car Park

	Organic Alcohols	Chlorinated Alkanes														Chlorinated Alkenes										Trihalomethanes				TRHs (NEPC 2013)				BTEX			
	Isopropyl alcohol	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromochloromethane	Carbon tetrachloride	Trichlorofluoromethane	1,1-dichloroethene	1,1-dichloropropene	2-chlorotoluene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	>C10-C16 Fraction	>C6-C10 Fraction	F1 (C6-C10 - BTEX)	F2 (C6-C10 - Naphthalene)	Benzene	Ethylbenzene	Toluene	Xylene (Total)
	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3
EQL	1.67	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	1.67	1.67	1.67	1.67	0.08	0.08	0.08	0.25
NEPM 2013 HIL Recreational C Soil Vapour			1200																	2		40		0.4	0.5												
NEPM 2013 HIL Commercial/industrial D Soil Vapour			230																	0.3		8		0.08	0.1												
NEPM 2013 Soil Vapour HSL A & HSL B - Clay 0 to <1m																																230	180	1	420	1600	280
NEPM 2013 Soil Vapour HSL C - Clay 0 to <1m																																NL	NL	3000	NL	NL	NL
NEPM 2013 Soil Vapour HSL D - Clay 0 to <1m																																NL	NL	5	1800	6500	1200

Sample ID	Location	Lab Report	Sample Date																																			
QC01_SV	SV01_FRONT	545643	5/5/2017	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<1.667	<1.667	<1.667	<1.667	<0.083	<0.083	<0.083	<0.25
SV01_FRONT	SV01	545643	5/5/2017	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<1.667	<1.667	<1.667	<1.667	<0.083	<0.083	<0.083	<0.25
SV02_FRONT	SV02	545643	5/5/2017	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<1.667	<1.667	<1.667	<1.667	<0.083	<0.083	<0.083	<0.25
SV03_FRONT	SV03	545643	5/5/2017	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	<0.083	<0.083	<0.083	<0.25
SV04_FRONT	SV04	545643	5/5/2017	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<1.667	<1.667	<1.667	1.833	<0.083	<0.083	<0.083	<0.25
SV05_FRONT	SV05	545643	5/5/2017	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	56.67	<0.083	9.333	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	<0.083	<0.083	<0.083	<0.25
SV06_FRONT	SV06	545643	5/5/2017	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	<0.083	<0.083	<0.083	<0.25
SV07_FRONT	SV07	545643	5/5/2017	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	<0.083	<0.083	<0.083	<0.25
SV08_FRONT	SV08	545643	5/5/2017	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	<0.083	<0.083	<0.083	<0.25
SV09_FRONT	SV09	545643	5/5/2017	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	<0.083	<0.083	<0.083	<0.25
SV10_FRONT	SV10	545643	5/5/2017	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	14.5	<0.083	3.5	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	<0.083	<0.083	<0.083	<0.25

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table C(1) - Soil Vapour
Project Number: 52372
Project Name: Penrith Central Car Park

	Polycyclic Aromatic Hydrocarbons	Monocyclic Aromatic Hydrocarbons									Miscellaneous Hydrocarbons		Chlorinated Benzenes						Miscellaneous Industrial Chemicals
	Naphthalene	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	4-isopropyl toluene	Isopropylbenzene	n-butyl benzene	n-propyl benzene	sec-butyl benzene	Styrene	Tert-butyl benzene	1,2-dibromoethane	Dibromomethane	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Hexachlorobutadiene
	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3
EQL	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.83	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
NEPM 2013 HIL Recreational C Soil Vapour																			
NEPM 2013 HIL Commercial/Industrial D Soil Vapour																			
NEPM 2013 Soil Vapour HSL A & HSL B - Clay 0 to <1m	1																		
NEPM 2013 Soil Vapour HSL C - Clay 0 to <1m	NL																		
NEPM 2013 Soil Vapour HSL D - Clay 0 to <1m	4																		

Sample ID	Location	Lab Report	Sample Date																
QC01_SV	SV01_FRONT	545643	5/5/2017	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083
SV01_FRONT	SV01	545643	5/5/2017	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083
SV02_FRONT	SV02	545643	5/5/2017	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083
SV03_FRONT	SV03	545643	5/5/2017	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083
SV04_FRONT	SV04	545643	5/5/2017	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083
SV05_FRONT	SV05	545643	5/5/2017	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083
SV06_FRONT	SV06	545643	5/5/2017	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083
SV07_FRONT	SV07	545643	5/5/2017	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083
SV08_FRONT	SV08	545643	5/5/2017	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083
SV09_FRONT	SV09	545643	5/5/2017	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083
SV10_FRONT	SV10	545643	5/5/2017	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table D(I): Waste Classification Criteria

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table D(1) - Soil Analytical Data (Waste Classification Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

	Metals & Metalloids									Chlorinated Alkanes																Chlorinated Alkenes										Trihalomethanes				TPHs (NEPC 1999)				TRHs (NEPC 2013)					
	Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Lead	Lead (TCLP)	Mercury (Inorganic)	Nickel	Zinc	1,1,1,2-tetrachloroethane	1,1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,1,2-trichloroethane	1,1,1-dichloroethane	1,2,3-trichloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	Bromochloromethane	Carbon tetrachloride	Chloroethane	Chloromethane	Dichlorodifluoromethane	Dichloromethane	Trichlorofluoromethane	1,1-dichloroethene	3-chloropropene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	>C10-C16 less Naphthalene (F2)	C6-C10 Fraction	C6-C10 less BTEX (F1)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	2.00	0.40	5.00	5.00	5.00	0.001	0.10	5.00	5.00	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	20.00	20.00	50.00	50.00	50.00	50.00	100.00	100.00	50.00	20.00	20.00
NSW EPA 2014 General Solid Waste (No Leaching)	100	20			100		4	40		200	600	26	24			10				10				172		14				14			10	4		120			650				10000					
NSW EPA 2014 General Solid Waste (with leached)	500	100			1500	5	50	1050		360	1080	46.8	43.2			18				18				310		25				25.2			18	7.2		216			650				10000					
NSW EPA 2014 Restricted Solid Waste (No Leaching)	400	80			400		16	160		800	2400	104	96			40				40				688		56				56			40	16		480			2600				40000					
NSW EPA 2014 Restricted Solid Waste (with leached)	2000	400			6000	25	200	4200		1440	4320	187.2	172.8			72				72				1240		100				100.8			72	28.8		864			2600				40000					

Sample ID	Location	Sample Depth	Sample Date	Lithological Type	Preliminary Waste Classification	Lab Report																																													
JB01_0.05-0.3	JB01	0.05-0.3	5/7/2017	Fill	Restricted Solid Waste (Non-putrescible	545235	12	<0.4	14	17	110	-	0.2	7.3	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20
JB01_1.1-1.2	JB01	1.1-1.2	5/7/2017	Natural	General Solid Waste (Non-putrescible)	545235	3.4	<0.4	9.9	17	6.2	-	<0.1	<5	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB02_0.05-0.25	JB02	0.05-0.25	5/7/2017	Fill	General Solid Waste (Non-putrescible)	545235	12	<0.4	7.3	13	87	-	0.1	5.2	180	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB03_0.05-0.2	JB03	0.05-0.2	5/7/2017	Fill	Restricted Solid Waste (Non-putrescible	545235	2.9	<0.4	7.7	7.3	120	-	<0.1	<5	53	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB04_0.4-0.5	JB04	0.4-0.5	5/7/2017	Fill	Restricted Solid Waste (Non-putrescible	545235	3.8	<0.4	9.7	24	110	-	<0.1	7.2	110	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20
JB05_0.1-0.2	JB05	0.1-0.2	5/7/2017	Fill	Restricted Solid Waste (Non-putrescible	545235	9	<0.4	21	42	120	-	0.2	27	170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB06_0.1-0.2	JB06	0.1-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	8.9	<0.4	69	<5	13	-	<0.1	<5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20
JB07_0.1-0.2	JB07	0.1-0.2	5/7/2017	Fill	General Solid Waste (Non-putrescible)	545235	7.8	<0.4	64	17	29	-	0.4	34	57	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-
JB08_0.1-0.2	JB08	0.1-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	3.9	<0.4	17	<5	6.5	-	<0.1	<5	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20
JB09_0.15-0.20	JB09	0.15-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	10	<0.4	46	28	15	-	<0.1	<5	7.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20160506_2	JB09	0.15-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	8.1	<0.4	42	16	20	-	<0.1	<5	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA20170506_2	JB09	0.15-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	166525	6	<0.4	32	15	14	-	<0.1	4	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB10_0.1-0.2	JB10	0.1-0.2	5/7/2017	Fill	General Solid Waste (Non-putrescible)	545235	8.8	<0.4	44	6.9	10	-	<0.1	<5	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20
JB11_0.05-0.15	JB11	0.05-0.15	5/6/2017	Fill	General Solid Waste (Non-putrescible) (Special - Asbestos)	545235	2.7	<0.4	6.3	23	31	-	<0.1	<5	93	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	39	480	350	869	51	710	140	51	<20	<20
JB11_0.35-0.45	JB11	0.35-0.45	5/6/2017	Natural	General Solid Waste (Non-putrescible)	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB12_0.1-0.25	JB12	0.1-0.25	5/7/2017	Fill	Restricted Solid Waste (Non-putrescible	545235	<2	<0.4	91	24	<5	-	<0.1	75	48	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	87	69	156	<50	120	<100	<50	<20	<20
JB12_1.1-1.2	JB12	1.1-1.2	5/7/2017	Natural	General Solid Waste (Non-putrescible)	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB13_0.1-0.2	JB13	0.1-0.2	5/7/2017	Fill	General Solid Waste (Non-putrescible)	545235	5.6	<0.4	13	12	25	-	<0.1	6.4	170	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB14_0.1-0.3	JB14	0.1-0.3	5/7/2017	Fill	General Solid Waste (Non-putrescible)	545235	5	0.8	18	61	57	-	0.3	14	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20
JB15-0.1-0.2	JB15	0.1-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	13	<0.4	110	5.9	16	-	<0.1	<5	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB16_0.05-0.15	JB16	0.05-0.15	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-
JB17_0.1-0.25	JB17	0.1-0.25	5/7/2017	Fill	General Solid Waste (Non-putrescible)	545235	10	<0.4	64	<5	13	-	<0.1	<5	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	58	58	<50	<100	<100	<50	<20	<20
JB18_0.1-0.2	JB18	0.1-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	7.5	<0.4	39	6.2	12	-	<0.1	<5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20
QC20160506_1	JB13	0.1-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	8.6	<0.4	50	<5	12	-	<0.1	<5	<5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20
QA20170506_1	JB13	0.1-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	166525	4	<0.4	38	5	8	-	<0.1	2	3	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<25	<50	<100	<100	<25	<50	<100	<100	<50	<25	<25
JB19_0.3-0.4	JB19	0.3-0.4	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-
JB19_1.6-1.7	JB19	1.6-1.7	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	5	<0.4	10	5.3	5.5	-	<0.1	5.4	29	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20
JB20_0.5-0.6	JB20	0.5-0.6	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	2.7	<0.4	10	<5	8	-	<0.1	<5	31	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20
JB20_1.25-1.35	JB20	1.25-1.35	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	4.6	0.4	12	25	49	-	0.1	7.7	100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB20_1.7-1.8	JB20	1.7-1.8	5/6/2017	Fill	Restricted Solid Waste (Non-putrescible	545235	4.4	<0.4	9.2	31	110	-	0.3	5.8	190	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	69	58	127	<50	110	<100	<50	<20	<20
JB20_1.9-2.0	JB20	1.9-2	5/6/2017	Natural	General Solid Waste (Non-putrescible)	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA01_0.25-0.4	JHA01	0.25-0.4	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	3.9	<0.4	21	11	6.8	-	<0.1	25	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20
JHA02_0.1-0.3	JHA02	0.1-0.3	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	50	0.5	11	230	430	0.03[#2]	0.3	8.8	290	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA02_0.3-0.5	JHA02	0.3-0.5	5/26/2017	Fill	Restricted Solid Waste (Non-putrescible	548083	49	0.5	12	200	910	0.49[#2]	0.4	8.7	340	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA04_0.2-0.4	JHA04	0.2-0.4	5/26/2017	Fill	Restricted Solid Waste (Non-putrescible	548083	2.7	<0.4	53	19	7	-	<0.1	58	38	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20
JHA04_0.6-0.8	JHA04	0.6-0.8	5/26/2017	Natural	General Solid Waste (Non-putrescible)	548083	8.4	<0.4	16	21	27	-	<0.1	14	25	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-
JHA05_0-0.2	JHA05	0-0.2	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	4.4	<0.4	24	15	39	-	<0.1	22	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA06_0.2-0.4	JHA06	0.2-0.4	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	2.2	<0.4	8	8.9	15	-	<0.1	6.8	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA06_0.4-0.6	JHA06	0.4-0.6	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	6.4	<0.4	14	20	37	-	<0.1	11	48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<20	<20	<50	74	74	<50	<100	<100	<50	<20	<20
JHA06_1.0-1.2	JHA06	1-1.2	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	6.9	<0.4	11	17	27	-	<0.1	13	50	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	55	55	<50	<100	<100	<50	<20	<20
JHA07_0.4-0.6	JHA07	0.4-0.6	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	<2	<0.4	<5	<5	<5	-	<0.1	<5	14	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20
JHA07_1.3-1.5	JHA07	1.3-1.5	5/26/2017	Natural	General Solid Waste (Non-putrescible)	548083	7	<0.4	11	19	12	-	<0.1	<5	18	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<20	<20	<50	<50	<50	<50	<100	<100	<50	<20	<20
QC20170526-1	JHA07	1.3-1.5	5/26/2017	Natural	General Solid Waste (Non-putrescible)	548083	2.9	<0.4	8	9.8	8.3	-	<0.1	<5	12	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-
Qc20170526-1A	JHA07	1.3-1.5	5/26/2017	Natural	General Solid Waste (Non-putrescible)	168063	<4	<0.4	12	16	9	-	<0.1	5	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA08_0.2-0.4	JHA08	0.2-0.4	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	5.1	<0.4	13	15	28	-	<0.1	13	310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA08_0.4-0.6	JHA08	0.4-0.6	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	2.6	<0.4	5.9	8.4	8.2	-	<0.1	<5	23	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Data Comments

#1 ESDAT Combined. Some Analytes are missing from this Combined Compound.
#2 ESDAT Combined with Non-Detect Multiplier of 0.5.
#3 Synthetic mineral fibres detected.
#4 No respirable fibres detected
#5 Organic fibres detected.
#6 ESDAT Combined.
#7 Nil
#8 AF:
#9 Assessed against Specific Contaminant Thresholds due to availability of TCLP Data

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table D(1) - Soil Analytical Data (Waste Classification Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

	BTEX						Polycyclic Aromatic Hydrocarbons																				Monocyclic Aromatic Hydrocarbons					Miscellaneous Hydrocarbons						Chlorinated Benzenes					Solvents	Polychlorinated Biphenyls								
	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (lower bound)*	Benzo(a)pyrene TEQ (medium bound)*	Benzo(a)pyrene TEQ (upper bound)*	Benzo(b,j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Carcinogenic PAHs as B(a)P TEQ	Phenanthrene	Pyrene	PAHs (Total)	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	Bromobenzene	Isopropylbenzene	Styrene	1,2-dibromoethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromomethane	Dibromomethane	Iodomethane	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Hexachlorobenzene	2-Propanone (Acetone)	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	PCBs (Total)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.10	0.10	0.10	0.10	0.20	0.30	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
NSW EPA 2014 General Solid Waste (No Leaching)	10	600	288			1000					0.8																				60		4000					86		150	2000										50-0
NSW EPA 2014 General Solid Waste (with leached)	18	1080	518			1800					10																				108		7200					155		270	3600										50-0
NSW EPA 2014 Restricted Solid Waste (No Leaching)	40	2400	1152			4000					3.2																				240		16000					344		600	8000										50-0
NSW EPA 2014 Restricted Solid Waste (with leached)	72	4320	2073			7200					23																				432		28800					620		1080	14400										50-0

Sample ID	Location	Sample Depth	Sample Date	Lithological Type	Preliminary Waste Classification	Lab Report																																															
JB01_0.05-0.3	JB01	0.05-0.3	5/7/2017	Fill	Restricted Solid Waste (Non-putrescible	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	0.6	0.7	0.9	1.2	1.5	0.8	0.7	0.5	0.7	<0.5	1.7	<0.5	<0.5	<0.5	1.179[#2]	0.6	1.7	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB01_1.1-1.2	JB01	1.1-1.2	5/7/2017	Natural	General Solid Waste (Non-putrescible)	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB02_0.05-0.25	JB02	0.05-0.25	5/7/2017	Fill	General Solid Waste (Non-putrescible)	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB03_0.05-0.2	JB03	0.05-0.2	5/7/2017	Fill	Restricted Solid Waste (Non-putrescible	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB04_0.4-0.5	JB04	0.4-0.5	5/7/2017	Fill	Restricted Solid Waste (Non-putrescible	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-
JB05_0.1-0.2	JB05	0.1-0.2	5/7/2017	Fill	Restricted Solid Waste (Non-putrescible	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB06_0.1-0.2	JB06	0.1-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-
JB07_0.1-0.2	JB07	0.1-0.2	5/7/2017	Fill	General Solid Waste (Non-putrescible)	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB08_0.1-0.2	JB08	0.1-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-
JB09_0.15-0.20	JB09	0.15-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20160506_2	JB09	0.15-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
QA20170506_2	JB09	0.15-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	166525	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB10_0.1-0.2	JB10	0.1-0.2	5/7/2017	Fill	General Solid Waste (Non-putrescible)	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-
JB11_0.05-0.15	JB11	0.05-0.15	5/6/2017	Fill	General Solid Waste (Non-putrescible) (Special - Asbestos)	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JB11_0.35-0.45	JB11	0.35-0.45	5/6/2017	Natural	General Solid Waste (Non-putrescible)	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB12_0.1-0.25	JB12	0.1-0.25	5/7/2017	Fill	Restricted Solid Waste (Non-putrescible	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#1]	0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-
JB12_1.1-1.2	JB12	1.1-1.2	5/7/2017	Natural	General Solid Waste (Non-putrescible)	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB13_0.1-0.2	JB13	0.1-0.2	5/7/2017	Fill	General Solid Waste (Non-putrescible)	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB14_0.1-0.3	JB14	0.1-0.3	5/7/2017	Fill	General Solid Waste (Non-putrescible)	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-
JB15-0.1-0.2	JB15	0.1-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5
JB16_0.05-0.15	JB16	0.05-0.15	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB17_0.1-0.25	JB17	0.1-0.25	5/7/2017	Fill	General Solid Waste (Non-putrescible)	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-
JB18_0.1-0.2	JB18	0.1-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QC20160506_1	JB13	0.1-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.2146	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
QA20170506_1	JB13	0.1-0.2	5/6/2017	Fill	General Solid Waste (Non-putrescible)	166525	<0.2	<1	<0.5	<1	<2	<1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1.21[#1]	<0.1	<0.1	<0.05	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
JB19_0.3-0.4	JB19	0.3-0.4	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
JB19_1.6-1.7	JB19	1.6-1.7	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JB20_0.5-0.6	JB20	0.5-0.6	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-
JB20_1.25-1.35	JB20	1.25-1.35	5/6/2017	Fill	General Solid Waste (Non-putrescible)	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JB20_1.7-1.8	JB20	1.7-1.8	5/6/2017	Fill	Restricted Solid Waste (Non-putrescible	545235	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	1.2	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	1	2.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JB20_1.9-2.0	JB20	1.9-2	5/6/2017	Natural	General Solid Waste (Non-putrescible)	545235	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA01_0.25-0.4	JHA01	0.25-0.4	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	0.8	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	0.8	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JHA02_0.1-0.3	JHA02	0.1-0.3	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA02_0.3-0.5	JHA02	0.3-0.5	5/26/2017	Fill	Restricted Solid Waste (Non-putrescible	548083	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	0.8	0.9	1.2	1.5	1.7	0.7	0.7	0.8	1.1	<0.5	2.3	<0.5	0.6	<0.5	1.458[#2]	0.8	2.1	10.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA04_0.2-0.4	JHA04	0.2-0.4	5/26/2017	Fill	Restricted Solid Waste (Non-putrescible	548083	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JHA04_0.6-0.8	JHA04	0.6-0.8	5/26/2017	Natural	General Solid Waste (Non-putrescible)	548083	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
JHA05_0-0.2	JHA05	0-0.2	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA06_0.2-0.4	JHA06	0.2-0.4	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA06_0.4-0.6	JHA06	0.4-0.6	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA06_1.0-1.2	JHA06	1-1.2	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JHA07_0.4-0.6	JHA07	0.4-0.6	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JHA07_1.3-1.5	JHA07	1.3-1.5	5/26/2017	Natural	General Solid Waste (Non-putrescible)	548083	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1.21[#1]	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-	-	-	-
QC20170526-1	JHA07	1.3-1.5	5/26/2017	Natural	General Solid Waste (Non-putrescible)	548083	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	-	-	-	-	-	-	-	-
Qc20170526-1A	JHA07	1.3-1.5	5/26/2017	Natural	General Solid Waste (Non-putrescible)	168063	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JHA08_0.2-0.4	JHA08	0.2-0.4	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.05	-	<0.5	<0.1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
JHA08_0.4-0.6	JHA08	0.4-0.6	5/26/2017	Fill	General Solid Waste (Non-putrescible)	548083	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Data Comments

#1 ESDAT Combined. Some Analytes are missing from this Combined Compound.
#2 ESDAT Combined with Non-Detect Multiplier of 0.5.
#3 Synthetic mineral fibres detected.
#4 No respirable fibres detected
#5 Organic fibres detected.
#6 ESDAT Combined.
#7 Nil
#8 AF:
#9 Assessed against Specific Contaminant Thresholds due to availability of TCLP Data

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table D(1) - Soil Analytical Data (Waste Classification Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

| | | |

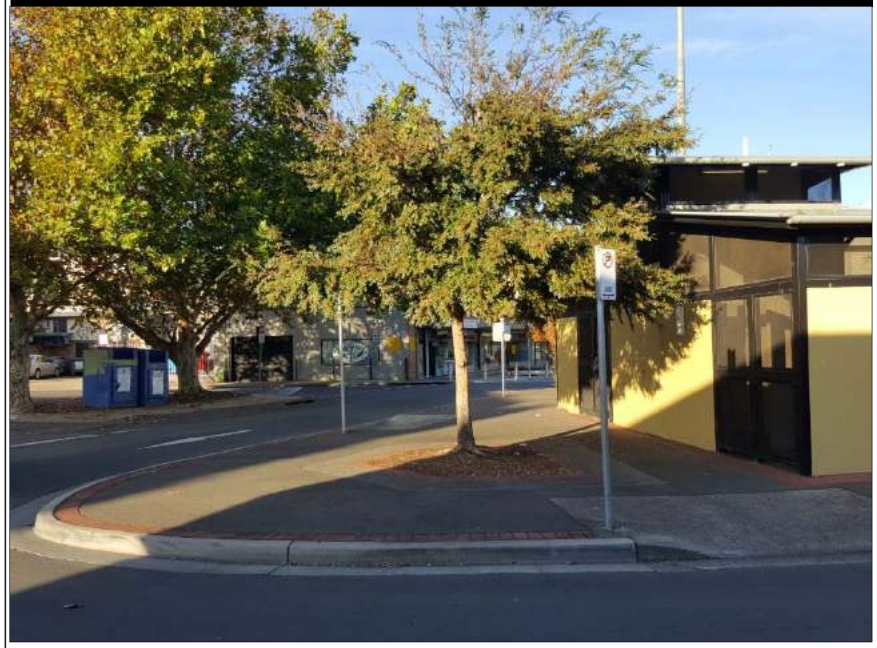
Appendix A Geotechnical Investigation

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix B Photographic Log

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1 – EASTERN CORNER LOOKING SOUTH



2 – EASTERN CORNER LOOKING WEST

3 – EASTERN CORNER LOOKING SOUTH (2)

4 – EASTERN CORNER LOOKING SOUTHWEST

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD

Not to Scale

Coord. Sys n/a

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5 – EASTERN PORTION LOOKING NORTHWEST

6 – EASTERN PORTION LOOKING WEST

7 – EASTERN PORTION LOOKING WEST-SOUTHWEST

8 – EASTERN PORTION LOOKING WEST-SOUTHWEST

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD

Not to Scale

Coord. Sys n/a

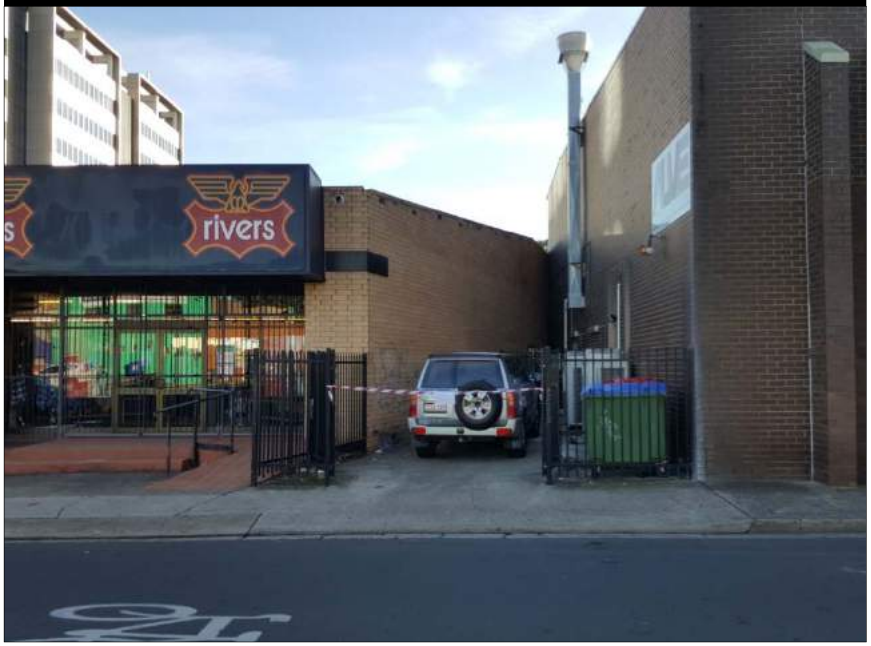
114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

9 – CENTRAL PORTION LOOKING TO FORMER SERVICE STATION (RIVERS)

10 – CENTRAL PORTION LOOKING TO FORMER SERVICE STATION (RIVERS)



11 – CENTRAL PORTION LOOKING NORTH

12 – CENTRAL PORTION LOOKING TO CURRENT DRYCLEANERS

JBS&G

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

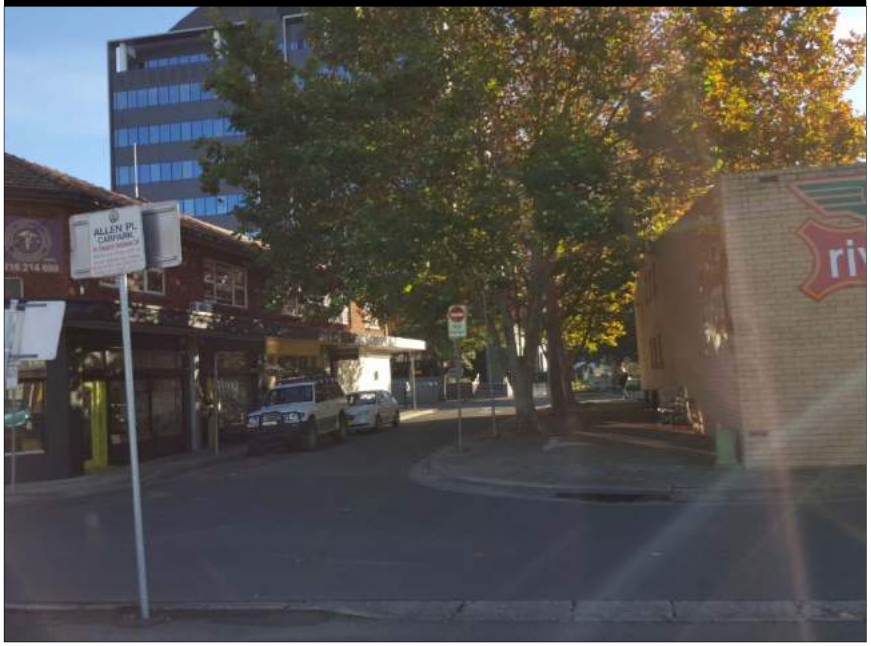
114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

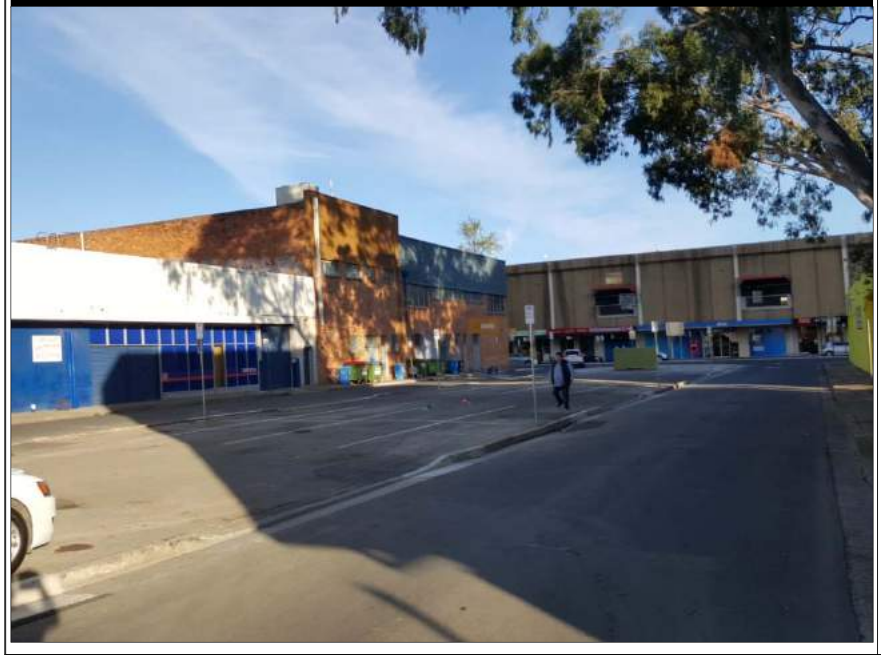
Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

13 – CENTRAL PORTION LOOKING NORTH (DRY CLEANER & GAYMARK LANE)

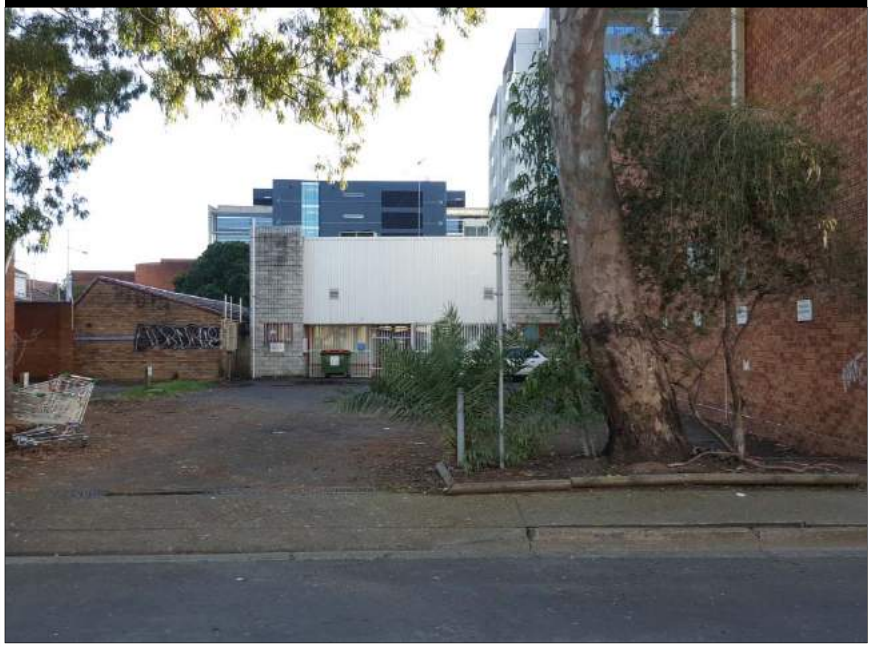
14 - CENTRAL PORTION LOOKING NORTH (DRY CLEANER & GAYMARK LANE)



15 – WESTERN PORTION LOOKING WEST



16 – WESTERN PORTION LOOKING NORTH



JBS&G

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

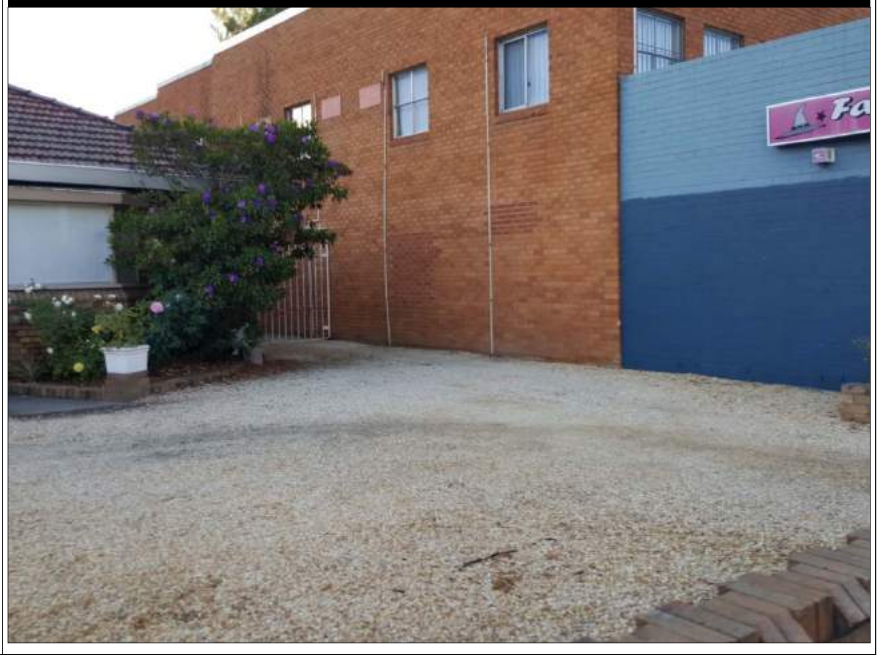
Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

17 – WESTERN PORTION LOOKING WEST

18 – NORTH WESTERN CORNER LOOKING EAST (44 STATION ST)

19 – NORTHWEST CORNER (44 STATION ST)

20 – NORTHWEST CORNER (44 STATION ST)



JBS&G

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

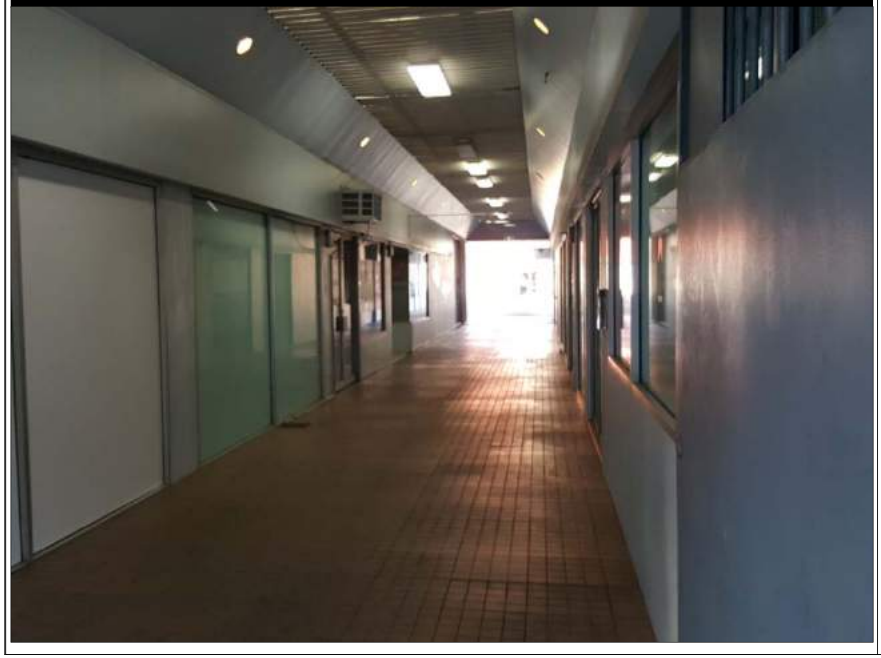
APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

21 – NORTHWEST CORNER (44 STATION ST)

22 – NORTHERN BOUNDARY LOOKING EAST

23 – NORTHERN BOUNDARY LOOKING SOUTH



24 – NORTHERN BOUNDARY LOOKING EAST

JBS&G

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

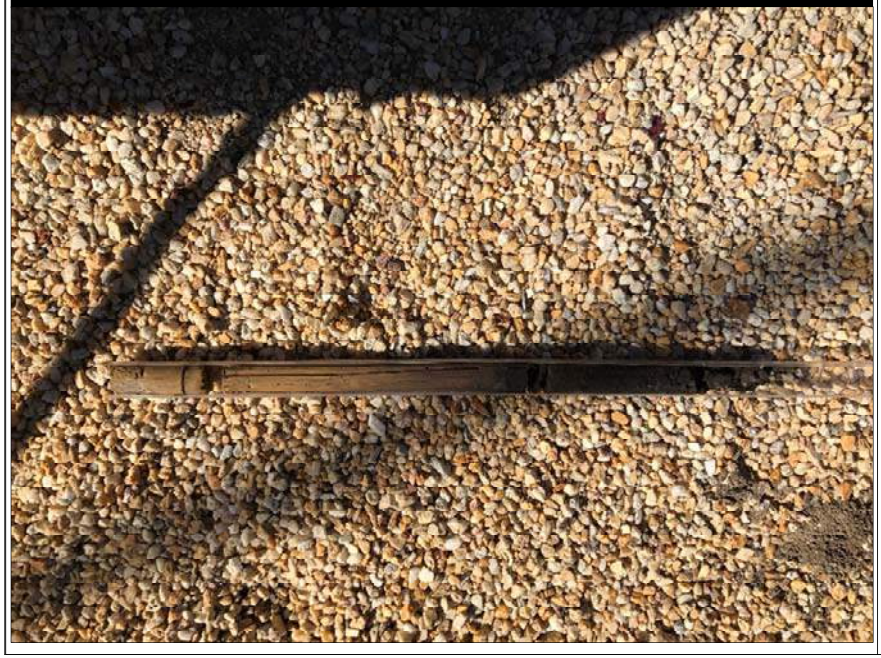
APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

25 – NORTHERN BOUNDARY CNR OF GAYMARK LANE LOOKING EAST

26 – NORTHERN BOUNDARY CNR OF GAYMARK LANE LOOKING SOUTH

27 – JB01



28 – JB02

JBS&G

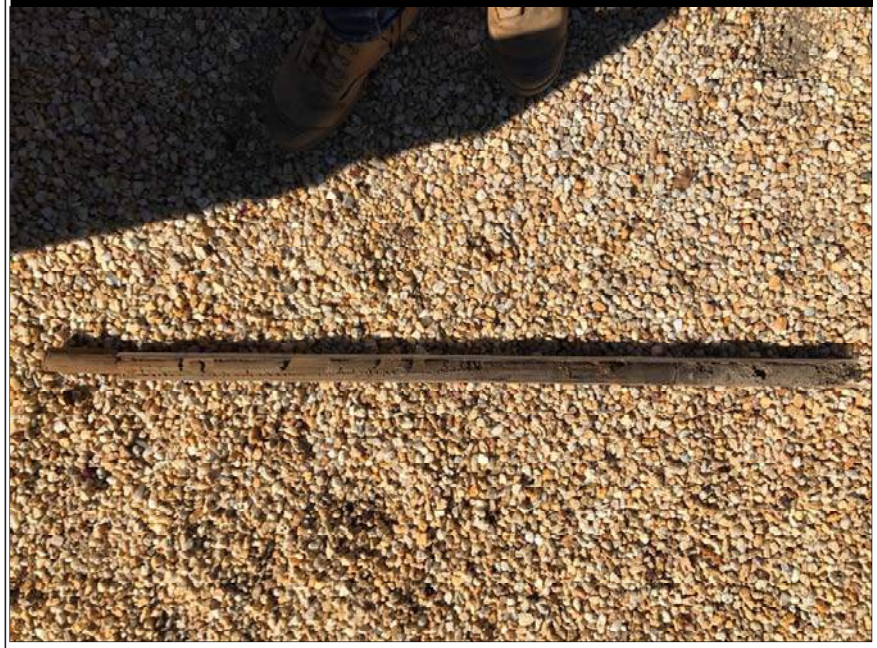
Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

29 – JB03



30 – JB04

31 – JB05

32 – JB08 (1)

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD

Not to Scale

Coord. Sys n/a

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

33 – JB08 (2)

34 – JB10

35 – JB10 REINSTATEMENT

36 – JB13

JBS&G

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

37 – JB14

38 – JB16 (1)

39 – JB16 (2)

40 – JB17

JBS&G

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

41 – JB18

42 – JB19

43 – JB19 REINSTATEMENT

44 – JB20

JBS&G

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

45 – JHA01 (1)

46 – JHA01 (2)

47 – JHA01 (3)

48 – JHA02

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD

Not to Scale

Coord. Sys n/a

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

49 – JHA02 (2) [INCORRECTLY LABELLED ON SITE]

50 – JHA03

51 – JHA04

52 – JHA05

JBS&G

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

53 – JHA06

54 – JHA07

55 – JHA08

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

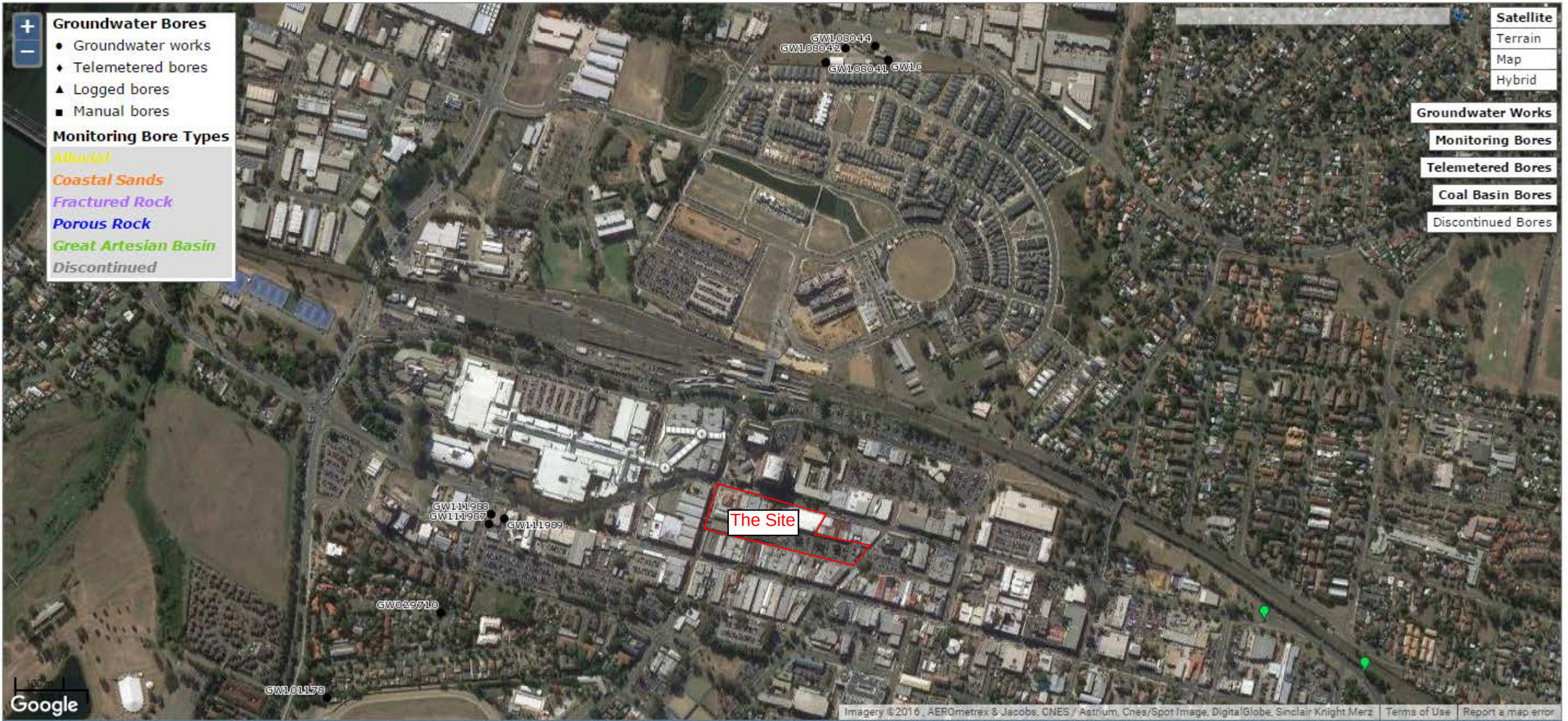
Appendix C Groundwater Well Installation Logs

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

All Groundwater Map

All data times are Eastern Standard Time

Map | Info



Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

NSW Office of Water
Work Summary

GW026231

Licence: 10BL019074 **Licence Status:** CANCELLED

Authorised Purpose(s): PUBLIC/MUNICIPL,RECREATION (GROUNDWATER)
Intended Purpose(s): IRRIGATION

Work Type: Well
Work Status:
Construct.Method:
Owner Type: Local Govt

Commenced Date:
Completion Date: 01/01/1966
Final Depth: 8.50 m
Drilled Depth: 8.50 m

Contractor Name:
Driller:
Assistant Driller:

Property: N/A
GWMA: 603 - SYDNEY BASIN
GW Zone: -
Standing Water Level (m):
Salinity Description: 1001-3000 ppm
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	90 752044
Licensed:	CUMBERLAND	MULGOA	Whole Lot //

Region: 10 - Sydney South Coast
River Basin: 212 - HAWKESBURY RIVER
Area/District:
CMA Map: 9030-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6262162.0
Easting: 285724.0
Latitude: 33°45'32.3"S
Longitude: 150°41'11.2"E

GS Map: -
MGA Zone: 0
Coordinate Source: GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	Concrete Cylnder	0.00	7.30	1828			
1	1	Casing	Concrete Cylnder	7.30	8.50	1524			Seated on Bottom

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
6.00	8.40	2.40	Unconsolidated	6.00		2.53			

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	4.26	4.26	Silt	Silt	
4.26	8.53	4.27	Gravel Alluvial Water Supply	Gravel	
0.00	4.26	4.26	Loam Clay	Loam	

Remarks

19/02/1975: SITED PENRITH PARK

***** End of GW026231 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

NSW Office of Water
Work Summary

GW029710

Licence: 10BL018657
Licence Status: CONVERTED

Authorised Purpose(s): DOMESTIC
Intended Purpose(s): GENERAL USE

Work Type: Well
Work Status:
Construct.Method: Hand Dug
Owner Type: Private

Commenced Date:
Completion Date: 01/04/1969
Final Depth: 7.90 m
Drilled Depth: 7.90 m

Contractor Name:
Driller:
Assistant Driller:

Property: N/A
GWMA: 603 - SYDNEY BASIN
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.034	90
Licensed:	CUMBERLAND	MULGOA	Whole Lot 25//752044

Region: 10 - Sydney South Coast
River Basin: 212 - HAWKESBURY RIVER
Area/District:
CMA Map: 9030-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6262724.0
Easting: 286046.0
Latitude: 33°45'14.3"S
Longitude: 150°41'24.2"E

GS Map: -
MGA Zone: 0
Coordinate Source: GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	Concrete Cylnder	-0.40	-0.40	1219			

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
6.00	7.80	1.80	Unconsolidated	6.00		1.89			

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	2.74	2.74	Loam Red	Loam	
2.74	7.92	5.18	Sand Gravel Water Supply	Sand	

Remarks

10/03/1981: 9 WORTH ST PENRITH (LOT 25)

***** End of GW029710 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

NSW Office of Water
Work Summary

GW101178

Licence: 10BL158273 **Licence Status:** CANCELLED

Authorised Purpose(s): TEST BORE
Intended Purpose(s): INDUSTRIAL, RECREATION (GROUNDWATER)

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Rotary Air
Owner Type: Private

Commenced Date:
Completion Date: 15/01/1998
Final Depth: 11.20 m
Drilled Depth: 11.20 m

Contractor Name: INTERTEC DRILLING SERVICES
Driller: Colin Leslie Barden
Assistant Driller:

Property: N/A
GWMA: -
GW Zone: -
Standing Water Level: 8.000
Salinity:
Yield: 0.600

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	1 998482
Licensed:	CUMBERLAND	MULGOA	Whole Lot 90//752044

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6262566.0
Easting: 285844.0
Latitude: 33°45'19.3"S
Longitude: 150°41'16.2"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.00	200			Rotary Air
1		Hole	Hole	6.00	11.20	168			Other
1		Annulus	Waterworn/Rounded	-0.80	11.20				Graded, Q:0.100m3
1	1	Casing	Pvc Class 12	-0.80	11.20	114			Seated on Bottom, Glued
1	1	Casing	Steel	-0.80	11.20	168	158		Seated on Bottom, Welded
1	1	Opening	Slots - Vertical	6.20	10.20	168		1	Oxy-Acetylene Slotted, Steel, SL: 100.0mm, A: 2.00mm
1	1	Opening	Screen	7.70	10.70	114		1	PVC Class 12, Glued, A: 0.40mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
6.00	10.50	4.50	Unknown	8.00		0.60	11.20	01:00:00	180.00

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

0.00	2.00	2.00	Sandy clay	Sandy Clay	
2.00	6.00	4.00	Grey sand	Sand	
6.00	10.50	4.50	Coarse gravel and cobbles (water bearing)	Gravel	
10.50	11.20	0.70	Dark grey shale and clay	Shale	

Remarks

15/01/1998: Form A Remarks:
Chlorine added on completion.
19/04/2001: PREVIOUS LIC NO: 10BL158273
22/01/2013: Nat Carling, 22-Jan-2013; Added rock type codes to driller's log & added missing information (based on existing data).

***** End of GW101178 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

NSW Office of Water
Work Summary

GW103048

Licence: 10BL141316 **Licence Status:** CONVERTED

Authorised Purpose(s): RECREATION (GROUNDWATER),INDUSTRIAL
Intended Purpose(s): RECREATION (GROUNDWATER)

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date:
Completion Date: 01/01/1990
Final Depth: 8.00 m
Drilled Depth: 8.00 m

Contractor Name:
Driller:
Assistant Driller:

Property: PENRITH SHOWGROUND 127 - 141 STATION ST PENRITH 2750 NSW
GWMA: -
GW Zone: -
Standing Water Level: 6.000
Salinity:
Yield: 1.000

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	1//998482
Licensed:	CUMBERLAND	MULGOA	Whole Lot 1//998482

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6262406.0
Easting: 286110.0
Latitude: 33°45'24.7"S
Longitude: 150°41'26.4"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	8.00	0			Unknown
1	1	Casing	Concrete	0.00	0.00	1200			

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

***** End of GW103048 *****

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

NSW Office of Water
Work Summary

GW108041

Licence: 10BL600263 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date: **Final Depth:** 7.50 m
Completion Date: 12/04/2006 **Drilled Depth:** 7.50 m

Contractor Name:
Driller: Christopher David Kiernan
Assistant Driller:

Property: MOBIL 174 COREEN AVE PENRITH 2750 NSW **Standing Water Level:** 6.700
GWMA: - **Salinity:**
GW Zone: - **Yield:**

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	81 810416
Licensed:	CUMBERLAND	MULGOA	Whole Lot 81//810416

Region: 10 - Sydney South Coast **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6263735.0 **Latitude:** 33°44'42.0"S
Elevation Source: Unknown **Easting:** 286724.0 **Longitude:** 150°41'51.4"E

GS Map: - **MGA Zone:** 0 **Coordinate Source:** Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	7.50	100			Auger
1		Annulus	(Unknown)	0.00	0.00				Graded
1	1	Casing	Pvc Class 18	0.00	4.50	50	42		
1	1	Opening	Slots	4.50	7.50	50		1	Sawn, PVC Class 18

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
6.50	7.50	1.00	Unknown	6.70					

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	CONCRETE	Invalid Code	
0.20	0.40	0.20	CLAY L/BROWN	Invalid Code	
0.40	3.30	2.90	CLAY BECOMING ORANGE,BROWN	Clay	

3.30	7.50	4.20	GRAVEL,BROWN,WELL GRADED	Gravel	

Remarks

***** End of GW108041 *****

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NSW Office of Water
Work Summary

GW108042

Licence: 10BL600263 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date:
Completion Date: 22/04/2006
Final Depth: 8.00 m
Drilled Depth: 8.00 m

Contractor Name:
Driller: Christopher David Kiernan
Assistant Driller:

Property: MOBIL 174 COREEN AVE PENRITH 2750 NSW
GWMA: -
GW Zone: -
Standing Water Level: 6.400
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	81 810416
Licensed:	CUMBERLAND	MULGOA	Whole Lot 81//810416

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6263761.0
Easting: 286759.0
Latitude: 33°44'41.2"S
Longitude: 150°41'52.8"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	8.00	100			Auger
1		Annulus	(Unknown)	4.00	8.00				Graded
1	1	Casing	Pvc Class 18	0.00	5.00	50	42		
1	1	Opening	Slots	5.00	8.00	50		1	Sawn, PVC Class 18

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	CONCRETE	Invalid Code	
0.20	0.30	0.10	FILL,CLAY,GREY/BROWN	Fill	
0.30	2.50	2.20	CLAY,RED/BROWN	Clay	
2.50	7.50	5.00	GRAVELS,WELL GRADED	Gravel	

7.50	8.00	0.50	COARSE GRAINED SAND BANDS	Invalid Code	

Remarks

***** End of GW108042 *****

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NSW Office of Water
Work Summary

GW108043

Licence: 10BL600263 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date:
Completion Date: 22/04/2006
Final Depth: 9.00 m
Drilled Depth: 9.00 m

Contractor Name:
Driller: Christopher David Kiernan
Assistant Driller:

Property: MOBIL 174 COREEN AVE PENRITH 2750 NSW
GWMA: -
GW Zone: -
Standing Water Level: 6.800
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	81 810416
Licensed:	CUMBERLAND	MULGOA	Whole Lot 81//810416

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6263742.0
Easting: 286836.0
Latitude: 33°44'41.9"S
Longitude: 150°41'55.8"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	100			Auger
1		Annulus	(Unknown)	5.00	9.00				Graded
1	1	Casing	Pvc Class 18	0.00	6.00	50	42		
1	1	Opening	Slots	6.00	9.00	50		1	Sawn, PVC Class 18

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
7.00	9.00	2.00	Unknown	6.80					

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	4.80	4.80	CLAYEY SAND	Invalid Code	
4.80	5.40	0.60	SAND,BROWN, LOOSE,DDRY	Sand	
5.40	9.00	3.60	GRAVEL	Gravel	

Remarks

***** End of GW108043 *****

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NSW Office of Water
Work Summary

GW108044

Licence: 10BL600263 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date:
Completion Date: 22/04/2006
Final Depth: 9.50 m
Drilled Depth: 9.50 m

Contractor Name:
Driller: Christopher David Kiernan
Assistant Driller:

Property: MOBIL 174 COREEN AVE PENRITH 2750 NSW
GWMA: -
GW Zone: -
Standing Water Level: 6.600
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	81 810416
Licensed:	CUMBERLAND	MULGOA	Whole Lot 81//810416

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6263767.0
Easting: 286812.0
Latitude: 33°44'41.1"S
Longitude: 150°41'54.8"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.50	100			Auger
1		Annulus	(Unknown)	6.00	9.50				Graded
1	1	Casing	Pvc Class 18	0.00	6.50	50	42		
1	1	Opening	Slots	6.50	9.50	50		1	Sawn, PVC Class 18

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
8.20	9.50	1.30	Unknown	6.60					

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	CONCRETE	Invalid Code	
0.20	0.30	0.10	FILL,CLAY,GREY	Fill	
0.30	6.40	6.10	SILTY CLAYEY SAND,ORANGE,BROWN	Invalid Code	

6.40	9.50	3.10	GRAVELS,WET,MODERATE	Gravel	

Remarks

***** End of GW108044 *****

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NSW Office of Water
Work Summary

GW108484

Licence: 10BL163999 **Licence Status:** CONVERTED

Authorised Purpose(s): RECREATION (GROUNDWATER),INDUSTRIAL
Intended Purpose(s): RECREATION (GROUNDWATER)

Work Type: Well
Work Status:
Construct.Method: Rotary Air
Owner Type: Private

Commenced Date:
Completion Date: 06/09/2006
Final Depth: 11.00 m
Drilled Depth: 11.00 m

Contractor Name: Ultra Drilling
Driller: Peter Edward Davidson
Assistant Driller:

Property: PENRITH HARNESS TRACK 119 STATION ST PENRITH 2750 NSW
GWMA:
GW Zone:
Standing Water Level:
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	1//998482
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6262409.0
Easting: 285738.0
Latitude: 33°45'24.3"S
Longitude: 150°41'12.0"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	11.00	171			Rotary Air
1	1	Casing	Steel	0.30	8.00	168	158		Driven into Hole, Welded
1	1	Opening	Screen	8.00	11.00	125		1	Steel, Packer, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	6.00	6.00	CLAY	Clay	
6.00	8.50	2.50	SAND	Sand	
8.50	11.00	2.50	GRAVEL	Gravel	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Remarks

***** End of GW108484 *****

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NSW Office of Water
Work Summary

GW111987

Licence: 10BL603225 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Well
Work Status: Equipped
Construct.Method: Auger - Solid Flight
Owner Type: Private

Commenced Date:
Completion Date: 24/03/2010
Final Depth: 9.00 m
Drilled Depth: 9.00 m

Contractor Name: NUMAC
Driller: Christopher Mcmullen
Assistant Driller:

Property: WOOLWORTHS PETROL DIVISION CORNER WORTH AND HIGH STREET PENRITH 2750 NSW
Standing Water Level:
GWMA:
GW Zone:
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	3//541045
Licensed:			

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Area/District:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6262887.0
Easting: 286130.0
Latitude: 33°45'09.1"S
Longitude: 150°41'27.6"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	125			Auger - Solid Flight
1		Annulus	Waterworn/Rounded	0.00	0.00				Graded
1	1	Casing	Pvc Class 18	0.00	6.00	60	50		Seated on Bottom, Other
1	1	Opening	Slots - Horizontal	6.00	9.00	60		1	Casing - Machine Slotted, PVC Class 18, Other, SL: 40.0mm, A: 3.80mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
7.50	9.00	1.50	Unknown						

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.00	3.00	CLAY MINOR SAND RED BROWN	Clay	

3.00	9.00	6.00	GRAVEL WITH MINOR SAND	Gravel	

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status & fixed drillers log errors.

***** End of GW111987 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

NSW Office of Water
Work Summary

GW111988

Licence: 10BL603225 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Well
Work Status: Equipped
Construct.Method: Auger - Solid Flight
Owner Type: Private

Commenced Date:
Completion Date: 24/03/2010
Final Depth: 9.00 m
Drilled Depth: 9.00 m

Contractor Name: Numac Drilling Services
Driller: Christopher Mcmullen
Assistant Driller:

Property: WOOLWORTHS PETROL DIVISION CORNER WORTH AND HIGH STREET PENRITH 2750 NSW
Standing Water Level:
GWMA:
GW Zone:
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	3//541045
Licensed:			

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Area/District:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6262904.0
Easting: 286134.0
Latitude: 33°45'08.6"S
Longitude: 150°41'27.7"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	125			Auger - Solid Flight
1		Annulus	Waterworn/Rounded	0.00	0.00				Graded
1	1	Casing	Pvc Class 18	0.00	6.00	60	50		Seated on Bottom
1	1	Opening	Slots - Horizontal	6.00	9.00	60		1	Casing - Machine Slotted, PVC Class 18, Other, SL: 40.0mm, A: 3.80mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
7.50	9.00	1.50	Unknown						

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.00	3.00	CLAY MINOR SAND RED BROWN	Clay	

3.00	9.00	6.00	GRAVEL WITH MINOR SAND	Gravel	

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status & fixed drillers log errors.

***** End of GW111988 *****

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NSW Office of Water
Work Summary

GW111989

Licence: 10BL603225 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Well
Work Status: Equipped
Construct.Method: Auger - Solid Flight
Owner Type: Private

Commenced Date:
Completion Date: 24/03/2010
Final Depth: 9.00 m
Drilled Depth: 9.00 m

Contractor Name: Numac Drilling Services
Driller: Christopher Mcmullen
Assistant Driller:

Property: WOOLWORTHS PETROL DIVISION CORNER WORTH AND HIGH STREET PENRITH 2750 NSW
Standing Water Level:
GWMA:
Salinity:
GW Zone:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	3//541045
Licensed:			

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Grid Zone:
Scale:
Area/District:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6262897.0
Easting: 286157.0
Latitude: 33°45'08.8"S
Longitude: 150°41'28.7"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	125			Auger - Solid Flight
1		Annulus	Waterworn/Rounded	0.00	0.00				Graded
1	1	Casing	Pvc Class 18	0.00	6.00	60	50		Seated on Bottom, Other
1	1	Opening	Slots - Horizontal	6.00	9.00	60		1	Casing - Machine Slotted, PVC Class 18, Other, SL: 40.0mm, A: 3.80mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
7.50	9.00	1.50	Unknown						

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.00	3.00	CLAY MINOR SAND RED BROWN	Clay	

3.00	9.00	6.00	GRAVEL WITH MINOR SAND	Gravel	

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status & fixed drillers log errors.

***** End of GW111989 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

Appendix D Aerial Photographs

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

Approximate Site Boundary

JBS&G

Job No: 52372

Client: Penrith City Council

Version: Aerials	Date: 14-Jun-2017
Drawn By: SE	Checked By: KY

Scale 1:2,000

0 20 40

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

AERIAL PHOTOGRAPH 1943

AERIAL PHOTOGRAPH 1943

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

Approximate Site Boundary

JBS&G

Job No: 52372

Client: Penrith City Council

Version: Aerials	Date: 14-Jun-2017
Drawn By: SE	Checked By: KY

Scale 1:2,000

0 20 40

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

AERIAL PHOTOGRAPH 1956

AERIAL PHOTOGRAPH 1956

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

Approximate Site Boundary

JBS&G

Job No: 52372

Client: Penrith City Council

Version: Aerials	Date: 14-Jun-2017
Drawn By: SE	Checked By: KY

Scale 1:2,000

0 20 40

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

AERIAL PHOTOGRAPH 1965

AERIAL PHOTOGRAPH 1965

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

Approximate Site Boundary

JBS&G

Job No: 52372

Client: Penrith City Council

Version: Aerials	Date: 14-Jun-2017
Drawn By: SE	Checked By: KY

Scale 1:2,000

0 20 40

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

AERIAL PHOTOGRAPH 1978

AERIAL PHOTOGRAPH 1978

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

Approximate Site Boundary

JBS&G

Job No: 52372

Client: Penrith City Council

Version: Aerials	Date: 14-Jun-2017
Drawn By: SE	Checked By: KY

Scale 1:2,000

0 20 40

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

AERIAL PHOTOGRAPH 1986

AERIAL PHOTOGRAPH 1986

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

Approximate Site Boundary

JBS&G

Job No: 52372

Client: Penrith City Council

Version: Aerials	Date: 14-Jun-2017
Drawn By: SE	Checked By: KY

Scale 1:2,000

0 20 40

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

AERIAL PHOTOGRAPH 1994

AERIAL PHOTOGRAPH 1994

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

Approximate Site Boundary

JBS&G

Job No: 52372

Client: Penrith City Council

Version: Aerials	Date: 14-Jun-2017
Drawn By: SE	Checked By: KY

Scale 1:2,000

0 20 40

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

AERIAL PHOTOGRAPH 2005

AERIAL PHOTOGRAPH 2005

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Reference: Near Map www.nearmap.com, imagery date 06-11-2016, accessed 17-11-2016

Legend:

Approximate Site Boundary

JBS&G

Job No: 52372

Client: Penrith City Council

Version: Aerials	Date: 14-Jun-2017
Drawn By: SE	Checked By: KY

Scale 1:2,000

0 20 40

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

AERIAL PHOTOGRAPH 2016

AERIAL PHOTOGRAPH 2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix E EPA Records

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Search results

Your search for: **General Search** with the following criteria

Suburb - PENRITH

returned 73 results

Export to excel

1 of 4 Pages

Search Again

Number	Name	Location	Type	Status	Issued date
6357	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	POEO licence	Issued	07 Jun 2000
1007008	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	05 Jul 2002
1020003	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	09 Sep 2002
1072516	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	20 Aug 2007
1085783	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	21 Oct 2008
1104746	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	06 Aug 2009
1109805	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26 Feb 2010
1512576	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	12 Aug 2014
247	BORAL RESOURCES (NSW) PTY LTD	PEACHTREE ROAD, PENRITH, NSW 2750	POEO licence	No longer in force	22 Aug 2000
12405	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	09 Mar 2006
1070974	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	30 Jul 2007
1077652	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	31 Aug 2007
1109988	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19 Apr 2010
1525967	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	31 Oct 2014
1526072	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	11 Nov 2014
1098	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	26 Jun 2000
1017498	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	24 Nov 2003
1072470	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	20 Sep 2007
1104995	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	04 Nov 2009
1512789	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW	Compliance Audit	Complete	13 Mar 2013

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Search results

Your search for: **General Search** with the following criteria

Suburb - PENRITH

returned 73 results

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Search Again

Number	Name	Location	Type	Status	Issued date
1512775	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19 Mar 2013
1515690	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26 Jul 2013
1525217	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26 Sep 2014
10945	CUMMINS SOUTH PACIFIC PTY. LTD.	7 Andrews Road, PENRITH, NSW 2750	POEO licence	Surrendered	19 Jun 2000
1035208	CUMMINS SOUTH PACIFIC PTY. LTD.	7 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	08 Mar 2004
308	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	17 Jan 2000
1024084	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	06 Jan 2003
1044228	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	08 Feb 2005
11290	ENDEAVOUR ENERGY	96-120 Blaikie Road, PENRITH, NSW 2750	POEO licence	No longer in force	08 Jan 2001
1035197	ENDEAVOUR ENERGY	96-120 Blaikie Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	08 Mar 2004
20381	Glass Recovery Services Pty Ltd	126 Andrews Road, PENRITH, NSW 2740	POEO licence	Pending	
12132	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750	POEO licence	Surrendered	01 Oct 2004
1097227	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750	s.58 Licence Variation	Issued	02 Feb 2009
1104874	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750	s.58 Licence Variation	Issued	17 Aug 2009
6472	JAMES KEITH COSGROVE	8 HOYLE PLACE, PENRITH, NSW 2750	POEO licence	Surrendered	21 Jun 2000
1044521	JAMES KEITH COSGROVE	8 HOYLE PLACE, PENRITH, NSW 2750	s.58 Licence Variation	Issued	16 Feb 2005
7019	JAMISON PRIVATE HOSPITAL PROPERTY PTY LTD	366 JAMISON ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	20 Mar 2001
2869	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	05 Jun 2000
1012903	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	18 Feb 2002
1525246	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	02 Oct 2014

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Search results

Your search for: **General Search** with the following criteria

Suburb - PENRITH

returned 73 results

Export to excel

3 of 4 Pages

Search Again

Number	Name	Location	Type	Status	Issued date
3741	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	31 Jan 2001
1007235	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	10 May 2001
1008444	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	20 Aug 2001
2818	PANASONIC AVC NETWORKS AUSTRALIA PTY LTD	164 STATION STREET, PENRITH, NSW 2750	POEO licence	Surrendered	24 Mar 2000
1048338	PANASONIC AVC NETWORKS AUSTRALIA PTY LTD	164 STATION STREET, PENRITH, NSW 2750	s.58 Licence Variation	Issued	31 May 2005
10349	SYDNEY OLYMPIC PARK AUTHORITY	CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	06 Jan 2000
1409	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	25 May 2000
1005313	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	22 Oct 2001
1017898	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26 Jun 2002
1018895	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	23 Dec 2002
1028330	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	08 Jul 2003
1032690	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	25 Nov 2003
1032982	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19 Mar 2004
1047700	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	30 Jun 2005
1061410	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	29 Jun 2006
1074754	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	27 Jun 2007
1116048	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	02 Jul 2010
1129012	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	27 Jun 2011
1504851	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	28 Jun 2012
1528922	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	23 Mar 2015

08 November 2016

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Search results

Your search for: **General Search** with the following criteria

Suburb - PENRITH

returned 73 results

Export to excel

4 of 4 Pages

Search Again

Number	Name	Location	Type	Status	Issued date
1538189	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19 Feb 2016
11461	TOTAL CONCRETE SOLUTIONS PTY LIMITED	261 COOMBES DRIVE, PENRITH, NSW 2750	POEO licence	No longer in force	19 Oct 2001
1294	VICARY CORPORATION PTY LIMITED	60-62 REGENTVILLE ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	22 Aug 2000
12106	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	POEO licence	Surrendered	28 Apr 2004
1042219	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	10 Nov 2004
1065654	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	25 Oct 2006
1093267	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	10 Nov 2008
1127751	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	03 Jun 2011
5269	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	10 Aug 2000
1066270	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	15 Dec 2006
1072508	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	23 Jul 2007
1100623	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	07 Oct 2009
1526064	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	11 Nov 2014

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08 November 2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Search results

Your search for:LGA: Penrith City Council

Matched 23 notices relating to 7 sites.

Search Again

Refine Search

Suburb	Address	Site Name	Notices related to this site
BERKSHIRE PARK	(Northern end of Compartment 5) The Northern ROAD	Castlereagh State Forest	6 former
COLYTON	88 Great Western HIGHWAY	Ampol Service Station	1 current
JAMISONTOWN	92 Mulgoa ROAD	7-Eleven Service Station	2 current
LUDDENHAM	Lot 4 The Northern ROAD	Elura Liquid Waste Disposal Site	1 current
MULGOA	Mulgoa ROAD	Penrith Waste Services	2 former
PENRITH	Castlereagh ROAD	Crane Enfield Metals	3 current and 3 former
ST MARYS	Vallance STREET	Drum Recycler	5 former

Page 1 of 1

8 November 2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

List of NSW Contaminated Sites Notified to EPA as of 30 August 2016

Background

A strategy to systematically assess, prioritise and respond to notifications under Section 60 of the *Contaminated Land Management Act 1997* (CLM Act) has been developed by the EPA. This strategy acknowledges the EPA's obligations to make information available to the public under *Government Information (Public Access) Act 2009*.

When a site is notified to the EPA, it may be accompanied by detailed site reports where the owner has been proactive in addressing the contamination and its source. However, often there is minimal information on the nature or extent of the contamination.

For some notifications, the information indicates the contamination is securely immobilised within the site, such as under a building or carpark, and is not currently causing any offsite consequences to the community or environment. Such sites would still need to be cleaned up, but this could be done in conjunction with any subsequent building or redevelopment of the land. These sites may not require intervention under the CLM Act, but could be dealt with through the planning and development consent process.

Where indications are that the nominated site is causing actual harm to the environment or an unacceptable offsite impact (i.e. it is a "significantly contaminated site"), the EPA would apply the regulatory provisions of the CLM Act to have the responsible polluter and/or landowner investigate and remediate the site.

As such, the sites notified to the EPA and presented in the following table are at various stages of the assessment and/or remediation process. Understanding the nature of the underlying contamination, its implications and implementing a remediation program where required, can take a considerable period of time. The tables provide an indication, in relation to each nominated site, as to the management status of that particular site. Further detailed information may be available from the EPA or the responsible landowner.

The following questions and answers may assist those interested in this issue:

Frequently asked questions

What is the difference between the "List of NSW Contaminated Sites Notified to the EPA" and the "Contaminated Land: Record of Notices"?

A site will be on the Contaminated Land: Record of Notices only if the EPA has issued a regulatory notice in relation to the site under the *Contaminated Land Management Act 1997*.

The sites appearing on this "List of NSW contaminated sites notified to the EPA" indicate that the notifiers consider that the sites are contaminated and warrant reporting to the EPA. However, the contamination may or may not be significant enough to warrant regulation by the EPA. The EPA needs to review and, if necessary, obtain more information before it can make a determination as to whether the site warrants regulation.

Why my site appears on the list?

Your site appears on the list because of one or more of the following reasons:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- The site owner and/or the person partly or fully responsible for causing the contamination notified to the EPA about the contamination under Section 60 of the *Contaminated Land Management Act 1997*. In other words, the site owner or the "polluter" believes the site is contaminated.
- The EPA has been notified via other means and is satisfied that the site is or was contaminated.

Does the list contain all contaminated sites in NSW?

No. The list only contains contaminated sites that the EPA is aware of, with regard to its regulatory role under the CLM Act. An absence of a site from the list does not necessarily imply the site is not contaminated.

The EPA relies upon responsible parties to notify contaminated sites.

How are these notified contaminated sites managed by the EPA?

There are different ways that the EPA manages these notified contaminated sites. First, an initial assessment is carried out by the EPA. At the completion of the initial assessment, the EPA may take one or more than one of the following management approaches:

- The contamination warrants the EPA's direct regulatory intervention either under the *Contaminated Land Management Act 1997* or the *Protection of the Environment Operations Act 1997* (POEO Act), or both. Information about current or past regulatory action on this site can be found on EPA website.
- The contamination with respect to the current use or approved use of the site, as defined under the *Contaminated Land Management Act 1997,* is not significant enough that it warrants EPA regulation.
- The contamination does not require EPA regulation and can be managed by a planning approval process.
- The contamination is related to an operational Underground Petroleum Storage System, such as a service station or fuel depot. The contamination may be managed under the POEO Act and the Protection of the Environment Operation (Underground Petroleum Storage Systems) Regulation 2008.
- The contamination is being managed under a specifically tailored program operated by another agency (for example the Department of Industry and Investment's *Derelict Mines Program*).

I am the owner of a site that appears on the list. What should I do?

First of all, you should ensure the current use of the site is compatible with the site contamination. Secondly, if the site is the subject of EPA regulation, make sure you comply with the regulatory requirements, and you have considered your obligations to notify other parties who may be affected.

If you have any concerns, contact us and we may be able to offer you general advice, or direct you to accredited professionals who can assist with specific issues.

I am a prospective buyer of a site that appears on the list. What should I do?

You should seek advice from the vendor to put the contamination issue into perspective. You may need to seek independent expert advice.

The information provided in the list is meant to be indicative only, and a starting point for your own assessment. Site contamination as a legacy of past site uses is not uncommon,

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

particularly in an urbanised environment. If the contamination on a site is properly remediated or managed, it may not materially impact upon the intended future use of the site. However, each site needs to be considered in context.

List of NSW Contaminated Sites Notified to the EPA

Disclaimer

The EPA has taken all reasonable care to ensure that the information in the list of contaminated sites notified to the EPA (the list) is complete and correct. The EPA does not, however, warrant or represent that the list is free from errors or omissions or that it is exhaustive.

The EPA may, without notice, change any or all of the information in the list at any time.

You should obtain independent advice before you make any decision based on the information in the list.

The list is made available on the understanding that the EPA, its servants and agents, to the extent permitted by law, accept no responsibility for any damage, cost, loss or expense incurred by you as a result of:

1. any information in the list; or
2. any error, omission or misrepresentation in the list; or
3. any malfunction or failure to function of the list;
4. without limiting (2) or (3) above, any delay, failure or error in recording, displaying or updating information.

Site Status	Explanation
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or *Protection of the Environment Operations Act 1997*. Alternatively, the EPA may require information via a notice issued under s77 of the *Contaminated Land Management Act 1997* or issue a Preliminary Investigation Order.
Regulation under CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the *Contaminated Land Management Act 1997* is not required.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997*. A regulatory approach is being finalised.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the *Protection of the Environment Operations Act 1997* (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the *Environmental Planning and Assessment Act 1979* (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the *Protection of the Environment Operations Act 1997* (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the *Environmental Planning and Assessment Act 1979* (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the *Contaminated Land Management Act 1997* (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Suburb	Site Name	Site Address	Contamination Activity Type	Management Class	Latitude	Longitude
PENNANT HILLS	Shell Coles Express Pennant Hills West	386 Pennant Hills ROAD	Service Station	Contamination currently regulated under CLM Act	-33.73936462	151.0680237
PENRITH	Caltex Penrith Service Station	153 Coreen AVENUE	Service Station	Under assessment	-33.74287244	150.6927071
PENRITH	Former Mobil Depot	174 Coreen AVENUE	Other Petroleum	Under assessment	-33.74484268	150.6980504
PENRITH	Mirvac Industrial Site	2101 Castlereagh ROAD	Other Industry	Regulation under CLM Act not required	-33.73497514	150.6954097
PENRITH	7-Eleven (former Mobil) Service Station	212-222 Andrews ROAD	Service Station	Under assessment	-33.73059678	150.6952571
PENRITH	7-Eleven Service Station	30 Henry ROAD	Service Station	Under assessment	-33.75408799	150.7045594
PENRITH	Caltex Service Station	Castlereagh Rd Cnr Lugard STREET	Service Station	Under assessment	-33.73426843	150.6933382
PENRITH	Crane Enfield Metals	Castlereagh ROAD	Metal Industry	Contamination currently regulated under CLM Act	-33.73734959	150.696442
PENRITH	BP Express Service Station	Corner Coreen Avenue and Castlereagh ROAD	Service Station	Under assessment	-33.74385498	150.6925743
PENSHURST	7-Eleven Service Station	612 Forest ROAD	Service Station	Under assessment	-33.96153533	151.0793525
PENSHURST	Caltex Service Station	641 King Georges ROAD	Service Station	Under assessment	-33.95985335	151.0891118
PERISHER VALLEY	Perisher Centre Loading Dock	Kosciuszko ROAD	Other Petroleum	Regulation under CLM Act not required	-36.40392862	148.4111593
PERISHER VALLEY	Perisher Ski Resort	Kosciuszko ROAD	Other Petroleum	Regulation under CLM Act not required	-36.41106374	148.4005469
PETERSHAM	Fanny Durack Aquatic Centre	Station STREET	Unclassified	Regulation under CLM Act not required	-33.89194583	151.151824
PHEASANTS NEST	7-Eleven (former Mobil) Service Station	(Northbound) Hume HIGHWAY	Service Station	Under assessment	-34.28274509	150.6394175
PHEASANTS NEST	7-Eleven Service Station	(Southbound) Hume HIGHWAY	Service Station	Under assessment	-34.28318211	150.6362986
PICTON	McDonalds	69 -71 Argyle STREET	Service Station	Regulation under CLM Act not required	-34.16711877	150.6121524
PICTON	Coles Express Picton	93-99 Argyle STREET	Service Station	Under assessment	-34.16844337	150.6114236
PLUMPTON	Woolworths Service Station	Jersey ROAD	Service Station	Under assessment	-33.74478874	150.8369408
PORT BOTANY	Caltex Banksmeadow	1 -3 Penrhyn ROAD	Chemical Industry	Contamination currently regulated under POEO Act	-33.96335328	151.2171062
PORT BOTANY	Port Botany Bus Depot	1 Bumborah Point ROAD	Other Petroleum	Under assessment	-33.96880413	151.2255889
PORT BOTANY	Vopak B	20 Friendship ROAD	Chemical Industry	Under assessment	-33.97946548	151.2121752
PORT BOTANY	Smith Bros	4 Bumborah Point ROAD	Other Petroleum	Regulation under CLM Act not required	-33.9681757	151.2239505
PORT BOTANY	Terminals	45 Friendship ROAD	Chemical Industry	Under assessment	-33.97609287	151.2174402
PORT BOTANY	Vopak A	49 Friendship ROAD	Chemical Industry	Regulation under CLM Act not required	-33.97426175	151.2206228
PORT BOTANY	Bunnerong Canal	Between Brotherson Dock and Bumborah Point ROAD	Unclassified	Regulation under CLM Act not required	-33.96800557	151.2227633
PORT BOTANY	Sydney Ports Bulk Liquids Berth	Charlotte ROAD	Other Petroleum	Contamination currently regulated under POEO Act	-33.97418047	151.2123791
PORT BOTANY	Port Botany Railway Corridors	Friendship ROAD	Unclassified	Under assessment	-33.95467008	151.2178012
PORT BOTANY	Sydney Ports Marine Services	Interterminal Access ROAD	Other Petroleum	Under assessment	-33.97214594	151.2173122
PORT KEMBLA	Coates Hire	1 Flinders STREET	Other Industry	Under assessment	-34.47104817	150.89162
PORT KEMBLA	Caltex Service Station	16 Flinders STREET	Service Station	Under assessment	-34.47058088	150.8945864
PORT KEMBLA	Former Shell Depot	87-89 Flinders STREET	Other Petroleum	Under assessment	-34.46964995	150.8953859
PORT KEMBLA	Darcy Road Rail Sidings	Darcy ROAD	Other Industry	Under assessment	-34.47792834	150.9105503
PORT KEMBLA	No 2 Steelworks	Five Islands ROAD	Metal Industry	Contamination currently regulated under CLM Act	-34.45965024	150.8844432
PORT KEMBLA	Port Kembla Steelworks - No.1 Works Site	Five Islands ROAD	Metal Industry	Under assessment	-34.47386606	150.8794912

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix F Council Section 149 (2&5) Certificates

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PENRITH CITY COUNCIL

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

Property No: 319952
Your Reference: 52151 post
Contact No: 82450300

Issue Date: 10/11/2016
Certificate No: 16/05760
Receipt Date: 10/11/2016
Receipt No: 2617402

Issued to: K Yeung
1/50 Margaret Street
SYDNEY NSW 2000

PRECINCT 2010

DESCRIPTION OF LAND

County: CUMBERLAND **Parish: CASTLEREAGH**

Location: 118-120 Henry Street PENRITH NSW 2750
Land Description: Lot 1 DP 113118

- PART 1 PRESCRIBED MATTERS –

In accordance with the provisions of Section 149(2) of the Act the following information is furnished in respect of the abovementioned land:

1 *NAMES OF RELEVANT PLANNING INSTRUMENTS AND DCPs*

1(1) The name of each environmental planning instrument that applies to the carrying out of development on the land:

Penrith Local Environmental Plan 2010, published 22nd September 2010, as amended, applies to the land.

Sydney Regional Environmental Plan No.9 - Extractive Industry (No.2), gazetted 15 September 1995, as amended, applies to the local government area of Penrith.

Sydney Regional Environmental Plan No. 20 - Hawkesbury-Nepean River (No. 2 - 1997), gazetted 7 November 1997, as amended, applies to the local government area of Penrith (except land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies).

The following State environmental planning policies apply to the land (subject to the exclusions noted below):

State Environmental Planning Policy No.1 - Development Standards. (Note: This policy does not apply to the land to which Penrith Local Environmental Plan 2010 or State Environmental Planning Policy (Western Sydney Employment Area) 2009 apply.)

State Environmental Planning Policy No.19 - Bushland in Urban Areas. (Note: This policy does not apply to certain land referred to in the National Parks and Wildlife Act 1974 and the Forestry Act 1916.)

State Environmental Planning Policy No.21 - Caravan Parks.

State Environmental Planning Policy No.30 - Intensive Agriculture.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

State Environmental Planning Policy No.32 - Urban Consolidation (Redevelopment of Urban Land). (Note: This policy does not apply to land identified as coastal protection, environmental protection, escarpment, floodway, natural hazard, non-urban, rural, rural residential, water catchment or wetland.)
State Environmental Planning Policy No.33 - Hazardous and Offensive Development.
State Environmental Planning Policy No.50 - Canal Estate Development. (Note: This policy does not apply to the land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies.
State Environmental Planning Policy No.55 - Remediation of Land.
State Environmental Planning Policy No.62 - Sustainable Aquaculture.
State Environmental Planning Policy No.64 - Advertising and Signage.
State Environmental Planning Policy No.65 - Design Quality of Residential Apartment Development.
State Environmental Planning Policy No.70 - Affordable Housing (Revised Schemes).
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 (Note: This policy applies to land within New South Wales that is land zoned primarily for urban purposes or land that adjoins land zoned primarily for urban purposes, but only as detailed in clause 4 of the policy.)
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004.
State Environmental Planning Policy (Major Development) 2005.
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.
State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007.
State Environmental Planning Policy (Infrastructure) 2007.
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.
State Environmental Planning Policy (Affordable Rental Housing) 2009.
State Environmental Planning Policy (State and Regional Development) 2011.

1(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act:

The Planning Proposal for Penrith City Park seeks to amend Penrith Local Environmental Plan 2010 to rezone certain land in Station Street and Henry Street to B4 Mixed Use to expand the range of land uses within the vicinity of the future Penrith City Park. See www.penrithcity.nsw.gov.au <http://www.penrithcity.nsw.gov.au> for more information.

Draft State Environmental Planning Policy (Infrastructure) Amendment (Shooting Ranges) 2013 applies to the land.

1(3) The name of each development control plan that applies to the carrying out of development on the land:

Penrith Development Control Plan 2014 applies to the land.

2 *ZONING AND LAND USE UNDER RELEVANT LEPs*

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone (however described):

2(a)-(d) the identity of the zone; the purposes that may be carried out without development consent; the purposes that may not be carried out except with development consent; and the purposes that are prohibited within the zone. Any zone(s) applying to the land is/are listed below and/or in annexures.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

(Note: If no zoning appears in this section see section 1(1) for zoning and land use details (under the Sydney Regional Environmental Plan or State Environmental Planning Policy that zones this property).)

Zone B3 Commercial Core
(Penrith Local Environmental Plan 2010)

1 Objectives of zone

- To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
- To encourage appropriate employment opportunities in accessible locations.
- To maximise public transport patronage and encourage walking and cycling.
- To strengthen the role of Penrith City Centre as the business, retail and cultural centre for the region.

2 Permitted without consent

Nil

3 Permitted with consent

Amusement centres; Car parks; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Function centres; Helipads; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads: Sex services premises; Signage; Tourist and visitor accommodation; Veterinary hospitals

4 Prohibited

Bed and breakfast accommodation; Farm stay accommodation; Any other development not specified in item 2 or 3

Flood planning

All or part of the subject land is identified in Penrith Local Environmental Plan 2010 (PLEP 2010) Clause 7.2 Flood Planning. Development consent is required for any development on land to which Clause 7.2 of PLEP 2010 applies.

Additional information relating to Penrith Local Environmental Plan 2010

Note 1: Under the terms of Clause 2.4 of Penrith Local Environmental Plan 2010 development may be carried out on unzoned land only with development consent.

Note 2: Under the terms of Clause 2.6 of Penrith Local Environmental Plan 2010 land may be subdivided but only with development consent, except for the exclusions detailed in the clause.

Note 3: Under the terms of Clause 2.7 of Penrith Local Environmental Plan 2010 the demolition of a building or work may be carried out only with development consent.

Note 4: A temporary use may be permitted with development consent subject to the requirements of Clause 2.8 of Penrith Local Environmental Plan 2010.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Note 5: Under the terms of Clause 4.1A of Penrith Local Environmental Plan 2010, despite any other provision of this plan, development consent must not be granted for dual occupancy on an internal lot in Zone R2 Low Density Residential.

Note 6: Under the terms of Clause 5.1 of Penrith Local Environmental Plan 2010 development on land acquired by an authority of the State under the owner-initiated acquisition provisions may, before it is used for the purpose for which it is reserved, be carried out, with development consent, for any purpose.

Note 7: Under the terms of Clause 5.3 of Penrith Local Environmental Plan 2010 development consent may be granted to development of certain land for any purpose that may be carried out in an adjoining zone.

Note 8: Under the terms of Clause 5.9 of Penrith Local Environmental Plan 2010 trees or other vegetation subject to relevant sections of Penrith Development Control Plan 2014 must not be ringbarked, cut down, topped, lopped, removed, injured or wilfully destroyed without the authority conferred by a development consent or a Council permit.

Note 9: Under the terms of Clause 5.9AA of Penrith Local Environmental Plan 2010 (PLEP 2010) any tree or other vegetation that is not of a species or kind prescribed for the purposes of Clause 5.9 of PLEP 2010 by Penrith Development Control Plan 2014 may be ringbarked, cut down, topped, lopped, removed, injured or destroyed without development consent.

Note 10: Clause 5.10 of Penrith Local Environmental Plan 2010 details when development consent is required/not required in relation to heritage conservation.

Note 11: Under the terms of Clause 5.11 of Penrith Local Environmental Plan 2010 bush fire hazard reduction work authorised by the *Rural Fires Act 1997* may be carried out on any land without development consent.

Note 12: Under the terms of Clause 7.1 of Penrith Local Environmental Plan 2010 (PLEP 2010) development consent is required for earthworks unless the work is exempt development under PLEP 2010 or another applicable environmental planning instrument, or the work is ancillary to other development for which development consent has been given.

Note 13: Sex services premises and restricted premises may only be permitted subject to the requirements of Clause 7.23 of Penrith Local Environmental Plan 2010.

Under the provisions of the Planning Proposal for the Penrith City Park, the land is affected by the following draft zone:

Zone B4 Mixed Use

1 Objectives of zone

- To provide a mixture of compatible land uses.
- To integrate suitable business, office, residential, retail and other development in accessible locations so as to maximise public transport patronage and encourage walking and cycling.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- To minimise conflict between land uses within the zone and land uses within adjoining zones.
- To create opportunities to improve public amenity.
- To provide a wide range of retail, business, office, residential, community and other suitable land uses.

2 Permitted without consent

Home occupations

3 Permitted with consent

Amusement centres; Boarding houses; Car parks; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Function centres; Home-based child care; Home businesses; Hostels; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Multi dwelling housing; Passenger transport facilities; Places of public worship; Public administration buildings; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Registered clubs; Residential accommodation; Residential flat buildings; Respite day care centres; Restricted premises; Roads; Seniors housing; Serviced apartments; Sex services premises; Shop top housing; Signage; Veterinary hospitals.

4 Prohibited

Rural workers' dwellings; Any development not specified in item 2 or 3

2(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed:

(Information is provided in this section only if any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed.)

2(f) whether the land includes or comprises critical habitat:

(Information is provided in this section only if the land includes or comprises critical habitat.)

2(g) whether the land is in a conservation area (however described):

(Information is provided in this section only if the land is in a conservation area (however described).)

2(h) whether an item of environmental heritage (however described) is situated on the land:

(Information is provided in this section only if an item of environmental heritage (however described) is situated on the land.)

2A ZONING AND LAND USE UNDER STATE ENVIRONMENTAL PLANNING POLICY (SYDNEY REGION GROWTH CENTRES) 2006

(Information is provided in this section only if the land is within any zone under State Environmental Planning Policy (Sydney Region Growth Centres) 2006.)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

3 *COMPLYING DEVELOPMENT*

GENERAL HOUSING CODE

(The General Housing Code only applies if the land is within Zones R1, R2, R3, R4 or RU5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the General Housing Code **may** be carried out on the land if the land is within one of the abovementioned zones.

RURAL HOUSING CODE

(The Rural Housing Code only applies if the land is within Zones RU1, RU2, RU3, RU4, RU6 or R5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the Rural Housing Code **may** be carried out on the land if the land is within one of the abovementioned zones.

HOUSING ALTERATIONS CODE

Complying development under the Housing Alterations Code **may** be carried out on the land.

GENERAL DEVELOPMENT CODE

Complying development under the General Development Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL ALTERATIONS CODE

Complying development under the Commercial and Industrial Alterations Code **may** be carried out on the land.

SUBDIVISIONS CODE

Complying development under the Subdivisions Code **may** be carried out on the land.

DEMOLITION CODE

Complying development under the Demolition Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL (NEW BUILDINGS AND ADDITIONS) CODE

(The Commercial and Industrial (New Buildings and Additions) Code only applies if the land is within Zones B1, B2, B3, B4, B5, B6, B7, B8, IN1, IN2, IN3, IN4 or SP3 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the Commercial and Industrial (New Buildings and Alterations) Code **may** be carried out on the land if the land is within one of the abovementioned zones.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

FIRE SAFETY CODE

Complying development under the Fire Safety Code **may** be carried out on the land.

(NOTE: (1) Council has relied on Planning and Infrastructure Circulars and Fact Sheets in the preparation of this information. Applicants should seek their own legal advice in relation to this matter with particular reference to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

(2) Penrith Local Environmental Plan 2010 (if it applies to the land) contains additional complying development not specified in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.)

4 COASTAL PROTECTION

The land is not affected by the operation of sections 38 or 39 of the Coastal Protection Act 1979, to the extent that council has been so notified by the Department of Public Works.

5 MINE SUBSIDENCE

The land is not proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

6 ROAD WIDENING AND ROAD REALIGNMENT

The land is not affected by any road widening or road realignment under:
(a) Division 2 of Part 3 of the Roads Act 1993, or
(b) an environmental planning instrument, or
(c) a resolution of council.

7 COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS

(a) Council Policies

The land is affected by the Asbestos Policy adopted by Council.
The land is not affected by any other policy adopted by the council that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

(b) Other Public Authority Policies

The Bush Fire Co-ordinating Committee has adopted a Bush Fire Risk Management Plan that covers the local government area of Penrith City Council, and includes public, private and Commonwealth lands.
The land is not affected by a policy adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council, that restricts the development of the land because of the likelihood of land slip, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

7A FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION

(1) Development on the land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) (if such uses are permissible on the land) is subject to flood related development controls.

(2) Development on the land or part of the land for industrial or commercial purposes (if such uses are permissible on the land) is subject to flood related development controls.
Development on the land or part of the land for purposes other than industrial or commercial, or for purposes other than those referred to in (1) above, will be considered on a merits based approach and flood related development controls may apply.

Note: The land is subject to Penrith Development Control Plan 2014 Section C3.5 Flood Planning. On application and payment of the prescribed fee Council may be able to provide in writing a range of advice in regard to the extent of flooding affecting the property.

8 LAND RESERVED FOR ACQUISITION

No environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

9 CONTRIBUTIONS PLANS

The Cultural Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith.

The Penrith City Local Open Space Development Contributions Plan 2007 applies anywhere residential development is permitted within the City of Penrith, excluding industrial areas and the release areas identified in Appendix B of the Plan (Penrith Lakes, Cranebrook, Sydney Regional Environmental Plan No. 30 - St Marys, Waterside, Thornton, the WELL Precinct, Glenmore Park and Erskine Park). See
<http://www.penrithcity.nsw.gov.au/uploadedFiles/Content/Website/Our_Services/Planning_and_Development/Planning__Zoning_Information/Local_Planning_Documents/LocalOpenSpaceDCP(1).pdf>

The Penrith City District Open Space Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith, with the exclusion of industrial lands and the Penrith Lakes development site.

The Penrith City Centre Civic Improvement Plan applies to the land.

9A BIODIVERSITY CERTIFIED LAND

(Information is provided in this section only if the land is biodiversity certified land (within the meaning of Part 7AA of the *Threatened Species Conservation Act 1995*).)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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10 BIOBANKING AGREEMENTS

(Information is provided in this section only if Council has been notified by the Director-General of the Department of Environment, Climate Change and Water that the land is land to which a biobanking agreement under Part 7A of the *Threatened Species Conservation Act 1995* relates.)

11 BUSH FIRE PRONE LAND

The land is not identified as bush fire prone land according to Council records.

12 PROPERTY VEGETATION PLANS

(Information is provided in this section only if Council has been notified that the land is land to which a property vegetation plan under the Native Vegetation Act 2003 applies.)

13 ORDERS UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006

(Information is provided in this section only if Council has been notified that an order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land.)

14 DIRECTIONS UNDER PART 3A

(Information is provided in this section only if there is a direction by the Minister in force under section 75P(2)(c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect.)

15 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS AFFECTING SENIORS HOUSING

(Information is provided in this section only if:

(a) there is a current site compatibility certificate (seniors housing), of which the council is aware, issued under State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.)

16 SITE COMPATIBILITY CERTIFICATES FOR INFRASTRUCTURE

(Information is provided in this section only if there is a valid site compatibility certificate (infrastructure), of which council is aware, in respect of proposed development on the land.)

17 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR AFFORDABLE RENTAL HOUSING

(Information is provided in this section only if:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

(a) there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 17(1) or 37(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 have been imposed as a condition of consent to a development application in respect of the land.)

18 PAPER SUBDIVISION INFORMATION

(Information is provided in this section only if a development plan adopted by a relevant authority applies to the land or is proposed to be subject to a consent ballot, or a subdivision order applies to the land.)

19 SITE VERIFICATION CERTIFICATES

(Information is provided in this section only if there is a current site verification certificate, of which council is aware, in respect of the land.)

NOTE: The following matters are prescribed by section 59(2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate

(a) (Information is provided in this section only if, as at the date of this certificate, the land (or part of the land) is significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.)

(b) (Information is provided in this section only if, as at the date of this certificate, the land is subject to a management order within the meaning of the Contaminated Land Management Act 1997.)

(c) (Information is provided in this section only if, as at the date of this certificate, the land is the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.)

(d) (Information is provided in this section only if, at the date of this certificate, the land subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.)

(e) (Information is provided in this section only if the land is the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997 – a copy of which has been provided to Council.)

Note: Section 149(5) information for this property may contain additional information regarding contamination issues.

Note: The Environmental Planning and Assessment Amendment Act 1997 commenced operation on the 1 July 1998. As a consequence of this Act the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment (Amendment) Regulation 1998, Environmental Planning and Assessment (Further Amendment) Regulation 1998 and Environmental Planning and Assessment (Savings and Transitional) Regulation 1998 and Environmental Planning and Assessment Regulation 2000.

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Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

Information is provided only to the extent that Council has been notified by relevant government departments.

149(5) Certificate
This Certificate is directed to the following relevant matters affecting the land

When information pursuant to section 149(5) is requested the Council is under no obligation to furnish any of the information supplied herein pursuant to that section. Council draws your attention to section 149(6) which states that a council shall not incur any liability in respect of any advice provided in good faith pursuant to sub-section (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate.

Note:

- Council's 149(5) information does not include development consent or easement information. Details of development consents may be obtained by making enquiries with Council's Development Services Department pursuant to section 12 of the Local Government Act 1993 or (for development applications lodged after January 2007) by viewing the Online Services area at www.penrithcity.nsw.gov.au . Details of any easements may be obtained from a Title Search at Land and Property Information New South Wales.
- This certificate does not contain information relating to Complying Development Certificates.
- This certificate may not provide full details of development rights over the land.
-

* Threatened Species Conservation Act 1995

When considering any development application Council must have regard to the Threatened Species Conservation Act 1995. Please note that this legislation may have application to any land throughout the city. Interested persons should make their own enquiries in regard to the impact that this legislation could have on this land.

* Preservation of Trees and Vegetation

See Clauses 5.9 and 5.9AA of Penrith Local Environmental Plan 2010 and Chapter C2 of Penrith Development Control Plan 2014 for specific controls relating to the preservation of trees and vegetation.

* Development Control Plan General Information

Penrith Development Control Plan 2014 which applies to the land, sets out requirements for a range of issues that apply across the Penrith Local Government Area, including:

- Site Planning and Design Principles
- Vegetation Management
- Water Management
- Land Management
- Waste Management
- Landscape Design
- Culture and Heritage
- Public Domain
- Advertising and Signage
- Transport, Access and Parking
- Subdivision
- Noise and Vibration, and
- Infrastructure and Services.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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The Development Control Plan also specifies requirements relating to various types of land uses including:

- Rural Land Uses
- Residential Development
- Commercial and Retail Development, and
- Industrial Development

as well as for a number of specific activities, including child care centres; health consulting rooms; educational establishments; parent friendly amenities; places of public worship; vehicle repair stations; cemeteries, crematoria and funeral homes; extractive industries; and telecommunication facilities.
The Development Control Plan also details requirements relating to key precincts within the Penrith Local Government Area, including:

- Caddens
- Claremont Meadows Stage 2
- Cranebrook
- Emu Heights
- Emu Plains
- Erskine Business Park
- Glenmore Park
- Kingswood
- Mulgoa Valley
- Orchard Hills
- Penrith
- Penrith Health and Education Precinct
- Riverlink Precinct
- St Clair,
- St Marys / St Marys North, and
- Sydney Science Park.

Penrith Development Control Plan 2014 may be accessed at https://www.penrithcity.nsw.gov.au/Building-and-Development/Planning-and-Zoning/Planning-Controls/Development-Control-Plans/

* Penrith City Centre Controls

See Part 8 of Penrith Local Environmental Plan 2010 and Chapter E11 of Penrith Development Control Plan 2014 for specific controls relating to Penrith City Centre (which includes the subject property).

* Active Street Frontage

The land is identified as an "Active Street Frontage" on the Penrith Local Environmental Plan 2010 (PLEP 2010) Active Street Frontages Map. See Clause 7.8 of PLEP 2010 for details.

Alan Stoneham
General Manager

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

Property No: 792217
Your Reference: 52152 post
Contact No: 82450300

Issue Date: 11/11/2016
Certificate No: 16/05797
Receipt Date: 10/11/2016
Receipt No: 2617402

Issued to: K Yeung
1/50 Margaret Street
SYDNEY NSW 2000

PRECINCT 2010

DESCRIPTION OF LAND

County: CUMBERLAND **Parish: CASTLEREAGH**

Location: 146 Henry Street PENRITH NSW 2750
Land Description: Lot 3 DP 1200790

- PART 1 PRESCRIBED MATTERS –

In accordance with the provisions of Section 149(2) of the Act the following information is furnished in respect of the abovementioned land:

1 *NAMES OF RELEVANT PLANNING INSTRUMENTS AND DCPs*

1(1) The name of each environmental planning instrument that applies to the carrying out of development on the land:

Penrith Local Environmental Plan 2010, published 22nd September 2010, as amended, applies to the land.

Sydney Regional Environmental Plan No.9 - Extractive Industry (No.2), gazetted 15 September 1995, as amended, applies to the local government area of Penrith.

Sydney Regional Environmental Plan No. 20 - Hawkesbury-Nepean River (No. 2 - 1997), gazetted 7 November 1997, as amended, applies to the local government area of Penrith (except land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies).

The following State environmental planning policies apply to the land (subject to the exclusions noted below):

State Environmental Planning Policy No.1 - Development Standards. (Note: This policy does not apply to the land to which Penrith Local Environmental Plan 2010 or State Environmental Planning Policy (Western Sydney Employment Area) 2009 apply.)

State Environmental Planning Policy No.19 - Bushland in Urban Areas. (Note: This policy does not apply to certain land referred to in the National Parks and Wildlife Act 1974 and the Forestry Act 1916.)

State Environmental Planning Policy No.21 - Caravan Parks.

State Environmental Planning Policy No.30 - Intensive Agriculture.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Environmental Planning and Assessment Act, 1979

State Environmental Planning Policy No.32 - Urban Consolidation (Redevelopment of Urban Land). (Note: This policy does not apply to land identified as coastal protection, environmental protection, escarpment, floodway, natural hazard, non-urban, rural, rural residential, water catchment or wetland.)
State Environmental Planning Policy No.33 - Hazardous and Offensive Development.
State Environmental Planning Policy No.50 - Canal Estate Development. (Note: This policy does not apply to the land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies.
State Environmental Planning Policy No.55 - Remediation of Land.
State Environmental Planning Policy No.62 - Sustainable Aquaculture.
State Environmental Planning Policy No.64 - Advertising and Signage.
State Environmental Planning Policy No.65 - Design Quality of Residential Apartment Development.
State Environmental Planning Policy No.70 - Affordable Housing (Revised Schemes).
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 (Note: This policy applies to land within New South Wales that is land zoned primarily for urban purposes or land that adjoins land zoned primarily for urban purposes, but only as detailed in clause 4 of the policy.)
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004.
State Environmental Planning Policy (Major Development) 2005.
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.
State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007.
State Environmental Planning Policy (Infrastructure) 2007.
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.
State Environmental Planning Policy (Affordable Rental Housing) 2009.
State Environmental Planning Policy (State and Regional Development) 2011.

1(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act:

The Planning Proposal for Penrith City Park seeks to amend Penrith Local Environmental Plan 2010 to rezone certain land in Station Street and Henry Street to B4 Mixed Use to expand the range of land uses within the vicinity of the future Penrith City Park. See www.penrithcity.nsw.gov.au <http://www.penrithcity.nsw.gov.au> for more information.

Draft State Environmental Planning Policy (Infrastructure) Amendment (Shooting Ranges) 2013 applies to the land.

1(3) The name of each development control plan that applies to the carrying out of development on the land:

Penrith Development Control Plan 2014 applies to the land.

2 *ZONING AND LAND USE UNDER RELEVANT LEPs*

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone (however described):

2(a)-(d) the identity of the zone; the purposes that may be carried out without development consent; the purposes that may not be carried out except with development consent; and the purposes that are prohibited within the zone. Any zone(s) applying to the land is/are listed below and/or in annexures.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

(Note: If no zoning appears in this section see section 1(1) for zoning and land use details (under the Sydney Regional Environmental Plan or State Environmental Planning Policy that zones this property).)

Zone RE1 Public Recreation

(Penrith Local Environmental Plan 2010)

1 Objectives of zone

- To enable land to be used for public open space or recreational purposes.
- To provide a range of recreational settings and activities and compatible land uses.
- To protect and enhance the natural environment for recreational purposes.
- To ensure that development is secondary and complementary to the use of land as public open space, and enhances public use, and access to, the open space.
- To provide land for the development of services and facilities by public authorities for the benefit of the community.

2 Permitted without consent

Nil

3 Permitted with consent

Boat launching ramps; Boat sheds; Building identification signs; Car parks; Business identification signs; Charter and tourism boating facilities; Child care centres; Community facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Function centres; Information and education facilities; Jetties; Kiosks; Markets; Moorings; Public administration buildings; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Respite day care centres; Restaurants of cafes; Roads; Water recreation structures; Water storage facilities

4 Prohibited

Any other development not specified in item 2 or 3

Flood planning

All or part of the subject land is identified in Penrith Local Environmental Plan 2010 (PLEP 2010) Clause 7.2 Flood Planning. Development consent is required for any development on land to which Clause 7.2 of PLEP 2010 applies.

Additional information relating to Penrith Local Environmental Plan 2010

Note 1: Under the terms of Clause 2.4 of Penrith Local Environmental Plan 2010 development may be carried out on unzoned land only with development consent.

Note 2: Under the terms of Clause 2.6 of Penrith Local Environmental Plan 2010 land may be subdivided but only with development consent, except for the exclusions detailed in the clause.

Note 3: Under the terms of Clause 2.7 of Penrith Local Environmental Plan 2010 the demolition of a building or work may be carried out only with development consent.

Note 4: A temporary use may be permitted with development consent subject to the requirements of Clause 2.8 of Penrith Local Environmental Plan 2010.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

Note 5: Under the terms of Clause 4.1A of Penrith Local Environmental Plan 2010, despite any other provision of this plan, development consent must not be granted for dual occupancy on an internal lot in Zone R2 Low Density Residential.

Note 6: Under the terms of Clause 5.1 of Penrith Local Environmental Plan 2010 development on land acquired by an authority of the State under the owner-initiated acquisition provisions may, before it is used for the purpose for which it is reserved, be carried out, with development consent, for any purpose.

Note 7: Under the terms of Clause 5.3 of Penrith Local Environmental Plan 2010 development consent may be granted to development of certain land for any purpose that may be carried out in an adjoining zone.

Note 8: Under the terms of Clause 5.9 of Penrith Local Environmental Plan 2010 trees or other vegetation subject to relevant sections of Penrith Development Control Plan 2014 must not be ringbarked, cut down, topped, lopped, removed, injured or wilfully destroyed without the authority conferred by a development consent or a Council permit.

Note 9: Under the terms of Clause 5.9AA of Penrith Local Environmental Plan 2010 (PLEP 2010) any tree or other vegetation that is not of a species or kind prescribed for the purposes of Clause 5.9 of PLEP 2010 by Penrith Development Control Plan 2014 may be ringbarked, cut down, topped, lopped, removed, injured or destroyed without development consent.

Note 10: Clause 5.10 of Penrith Local Environmental Plan 2010 details when development consent is required/not required in relation to heritage conservation.

Note 11: Under the terms of Clause 5.11 of Penrith Local Environmental Plan 2010 bush fire hazard reduction work authorised by the *Rural Fires Act 1997* may be carried out on any land without development consent.

Note 12: Under the terms of Clause 7.1 of Penrith Local Environmental Plan 2010 (PLEP 2010) development consent is required for earthworks unless the work is exempt development under PLEP 2010 or another applicable environmental planning instrument, or the work is ancillary to other development for which development consent has been given.

Note 13: Sex services premises and restricted premises may only be permitted subject to the requirements of Clause 7.23 of Penrith Local Environmental Plan 2010.

Under the provisions of the Planning Proposal for the Penrith City Park, the land is affected by the following draft zone:

Zone RE1 Public Recreation

1 Objectives of zone

- To enable land to be used for public open space or recreational purposes.
- To provide a range of recreational settings and activities and compatible land uses.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- To protect and enhance the natural environment for recreational purposes.
- To ensure that development is secondary and complementary to the use of land as public open space, and enhances public use, and access to, the open space.
- To provide land for the development of services and facilities by public authorities for the benefit of the community.

2 Permitted without consent

Nil

3 Permitted with consent

Boat launching ramps; Boat sheds; Building identification signs; Car parks; Business identification signs; Charter and tourism boating facilities; Child care centres; Community facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Function centres; Information and education facilities; Jetties; Kiosks; Markets; Moorings; Public administration buildings; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Respite day care centres; Restaurants of cafes; Roads; Water recreation structures; Water storage facilities

4 Prohibited

Any other development not specified in item 2 or 3

2(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed:

(Information is provided in this section only if any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed.)

2(f) whether the land includes or comprises critical habitat:

(Information is provided in this section only if the land includes or comprises critical habitat.)

2(g) whether the land is in a conservation area (however described):

(Information is provided in this section only if the land is in a conservation area (however described).)

2(h) whether an item of environmental heritage (however described) is situated on the land:

(Information is provided in this section only if an item of environmental heritage (however described) is situated on the land.)

2A ZONING AND LAND USE UNDER STATE ENVIRONMENTAL PLANNING POLICY (SYDNEY REGION GROWTH CENTRES) 2006

(Information is provided in this section only if the land is within any zone under State Environmental Planning Policy (Sydney Region Growth Centres) 2006.)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

3 *COMPLYING DEVELOPMENT*

GENERAL HOUSING CODE

(The General Housing Code only applies if the land is within Zones R1, R2, R3, R4 or RU5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

- The land is affected by a reservation for a public purpose. If the land is within the relevant zones complying development under the General Housing Code **may not** be carried out on any part of the land that is reserved for a public purpose by an environmental planning instrument. Complying development **may** be carried out on any part of the land that is not reserved for a public purpose by an environmental planning instrument. For the purposes of this section "public purpose" means any land that is zoned either Zone E1, RE1, SP1 or SP2 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument, or land that is subject to acquisition.

RURAL HOUSING CODE

(The Rural Housing Code only applies if the land is within Zones RU1, RU2, RU3, RU4, RU6 or R5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

- The land is affected by a reservation for a public purpose. If the land is within the relevant zones complying development under the Rural Housing Code **may not** be carried out on any part of the land that is reserved for a public purpose by an environmental planning instrument. Complying development **may** be carried out on any part of the land that is not reserved for a public purpose by an environmental planning instrument. For the purposes of this section "public purpose" means any land that is zoned either Zone E1, RE1, SP1 or SP2 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument, or land that is subject to acquisition.

HOUSING ALTERATIONS CODE

Complying development under the Housing Alterations Code **may** be carried out on the land.

GENERAL DEVELOPMENT CODE

Complying development under the General Development Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL ALTERATIONS CODE

Complying development under the Commercial and Industrial Alterations Code **may** be carried out on the land.

SUBDIVISIONS CODE

Complying development under the Subdivisions Code **may** be carried out on the land.

DEMOLITION CODE

Complying development under the Demolition Code **may** be carried out on the land.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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COMMERCIAL AND INDUSTRIAL (NEW BUILDINGS AND ADDITIONS) CODE

(The Commercial and Industrial (New Buildings and Additions) Code only applies if the land is within Zones B1, B2, B3, B4, B5, B6, B7, B8, IN1, IN2, IN3, IN4 or SP3 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

- The land is affected by a reservation for a public purpose. If the land is within the relevant zones complying development under the Commercial and Industrial (New Buildings and Additions) Code **may not** be carried out on any part of the land that is reserved for a public purpose by an environmental planning instrument. Complying development **may** be carried out on any part of the land that is not reserved for a public purpose by an environmental planning instrument. For the purposes of this section "public purpose" means any land that is zoned either Zone E1, RE1, SP1 or SP2 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument, or land that is subject to acquisition.

FIRE SAFETY CODE

Complying development under the Fire Safety Code **may** be carried out on the land.

(NOTE: (1) Council has relied on Planning and Infrastructure Circulars and Fact Sheets in the preparation of this information. Applicants should seek their own legal advice in relation to this matter with particular reference to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

(2) Penrith Local Environmental Plan 2010 (if it applies to the land) contains additional complying development not specified in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.)

4 COASTAL PROTECTION

The land is not affected by the operation of sections 38 or 39 of the Coastal Protection Act 1979, to the extent that council has been so notified by the Department of Public Works.

5 MINE SUBSIDENCE

The land is not proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

6 ROAD WIDENING AND ROAD REALIGNMENT

The land is not affected by any road widening or road realignment under:
(a) Division 2 of Part 3 of the Roads Act 1993, or
(b) an environmental planning instrument, or
(c) a resolution of council.

7 COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS

(a) Council Policies

The land is affected by the Asbestos Policy adopted by Council.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

The land is not affected by any other policy adopted by the council that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

(b) Other Public Authority Policies

The Bush Fire Co-ordinating Committee has adopted a Bush Fire Risk Management Plan that covers the local government area of Penrith City Council, and includes public, private and Commonwealth lands.

The land is not affected by a policy adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council, that restricts the development of the land because of the likelihood of land slip, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

7A FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION

(1) Development on the land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) (if such uses are permissible on the land) is subject to flood related development controls.

(2) Development on the land or part of the land for industrial or commercial purposes (if such uses are permissible on the land) is subject to flood related development controls.

Development on the land or part of the land for purposes other than industrial or commercial, or for purposes other than those referred to in (1) above, will be considered on a merits based approach and flood related development controls may apply.

Note: The land is subject to Penrith Development Control Plan 2014 Section C3.5 Flood Planning. On application and payment of the prescribed fee Council may be able to provide in writing a range of advice in regard to the extent of flooding affecting the property.

8 LAND RESERVED FOR ACQUISITION

No environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

9 CONTRIBUTIONS PLANS

The Cultural Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith.

The Penrith City Local Open Space Development Contributions Plan 2007 applies anywhere residential development is permitted within the City of Penrith, excluding industrial areas and the release areas identified in Appendix B of the Plan (Penrith Lakes, Cranebrook, Sydney Regional Environmental Plan No. 30 - St Marys, Waterside, Thornton, the WELL Precinct, Glenmore Park and Erskine Park). See <http://www.penrithcity.nsw.gov.au/uploadedFiles/Content/Website/Our_Services/Planning_and_Development/Planning__Zoning_Information/Local_Planning_Documents/LocalOpenSpaceDCP(1).pdf>

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

The Penrith City District Open Space Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith, with the exclusion of industrial lands and the Penrith Lakes development site.

The Penrith City Centre Civic Improvement Plan applies to the land.

9A BIODIVERSITY CERTIFIED LAND

(Information is provided in this section only if the land is biodiversity certified land (within the meaning of Part 7AA of the *Threatened Species Conservation Act 1995*).)

10 BIOBANKING AGREEMENTS

(Information is provided in this section only if Council has been notified by the Director-General of the Department of Environment, Climate Change and Water that the land is land to which a biobanking agreement under Part 7A of the *Threatened Species Conservation Act 1995* relates.)

11 BUSH FIRE PRONE LAND

The land is not identified as bush fire prone land according to Council records.

12 PROPERTY VEGETATION PLANS

(Information is provided in this section only if Council has been notified that the land is land to which a property vegetation plan under the Native Vegetation Act 2003 applies.)

13 ORDERS UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006

(Information is provided in this section only if Council has been notified that an order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land.)

14 DIRECTIONS UNDER PART 3A

(Information is provided in this section only if there is a direction by the Minister in force under section 75P(2)(c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect.)

15 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS AFFECTING SENIORS HOUSING

(Information is provided in this section only if:

(a) there is a current site compatibility certificate (seniors housing), of which the council is aware, issued under State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

16 SITE COMPATIBILITY CERTIFICATES FOR INFRASTRUCTURE

(Information is provided in this section only if there is a valid site compatibility certificate (infrastructure), of which council is aware, in respect of proposed development on the land.)

17 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR AFFORDABLE RENTAL HOUSING

(Information is provided in this section only if:

(a) there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 17(1) or 37(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 have been imposed as a condition of consent to a development application in respect of the land.)

18 PAPER SUBDIVISION INFORMATION

(Information is provided in this section only if a development plan adopted by a relevant authority applies to the land or is proposed to be subject to a consent ballot, or a subdivision order applies to the land.)

19 SITE VERIFICATION CERTIFICATES

(Information is provided in this section only if there is a current site verification certificate, of which council is aware, in respect of the land.)

NOTE: The following matters are prescribed by section 59(2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate

(a) (Information is provided in this section only if, as at the date of this certificate, the land (or part of the land) is significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.)

(b) (Information is provided in this section only if, as at the date of this certificate, the land is subject to a management order within the meaning of the Contaminated Land Management Act 1997.)

(c) (Information is provided in this section only if, as at the date of this certificate, the land is the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.)

(d) (Information is provided in this section only if, at the date of this certificate, the land subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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(e) (Information is provided in this section only if the land is the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997 – a copy of which has been provided to Council.)

Note: Section 149(5) information for this property may contain additional information regarding contamination issues.

Note: The Environmental Planning and Assessment Amendment Act 1997 commenced operation on the 1 July 1998. As a consequence of this Act the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment (Amendment) Regulation 1998, Environmental Planning and Assessment (Further Amendment) Regulation 1998 and Environmental Planning and Assessment (Savings and Transitional) Regulation 1998 and Environmental Planning and Assessment Regulation 2000.

Information is provided only to the extent that Council has been notified by relevant government departments.

149(5) Certificate
This Certificate is directed to the following relevant matters affecting the land

When information pursuant to section 149(5) is requested the Council is under no obligation to furnish any of the information supplied herein pursuant to that section. Council draws your attention to section 149(6) which states that a council shall not incur any liability in respect of any advice provided in good faith pursuant to sub-section (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate.

Note:

- Council's 149(5) information does not include development consent or easement information. Details of development consents may be obtained by making enquiries with Council's Development Services Department pursuant to section 12 of the Local Government Act 1993 or (for development applications lodged after January 2007) by viewing the Online Services area at www.penrithcity.nsw.gov.au . Details of any easements may be obtained from a Title Search at Land and Property Information New South Wales.
- This certificate does not contain information relating to Complying Development Certificates.
- This certificate may not provide full details of development rights over the land.
-

* Threatened Species Conservation Act 1995

When considering any development application Council must have regard to the Threatened Species Conservation Act 1995. Please note that this legislation may have application to any land throughout the city. Interested persons should make their own enquiries in regard to the impact that this legislation could have on this land.

* Preservation of Trees and Vegetation

See Clauses 5.9 and 5.9AA of Penrith Local Environmental Plan 2010 and Chapter C2 of Penrith Development Control Plan 2014 for specific controls relating to the preservation of trees and vegetation.

* Development Control Plan General Information

Penrith Development Control Plan 2014 which applies to the land, sets out requirements for a range of issues that apply across the Penrith Local Government Area, including:

- Site Planning and Design Principles

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Vegetation Management
- Water Management
- Land Management
- Waste Management
- Landscape Design
- Culture and Heritage
- Public Domain
- Advertising and Signage
- Transport, Access and Parking
- Subdivision
- Noise and Vibration, and
- Infrastructure and Services.

The Development Control Plan also specifies requirements relating to various types of land uses including:

- Rural Land Uses
- Residential Development
- Commercial and Retail Development, and
- Industrial Development

as well as for a number of specific activities, including child care centres; health consulting rooms; educational establishments; parent friendly amenities; places of public worship; vehicle repair stations; cemeteries, crematoria and funeral homes; extractive industries; and telecommunication facilities.
The Development Control Plan also details requirements relating to key precincts within the Penrith Local Government Area, including:

- Caddens
- Claremont Meadows Stage 2
- Cranebrook
- Emu Heights
- Emu Plains
- Erskine Business Park
- Glenmore Park
- Kingswood
- Mulgoa Valley
- Orchard Hills
- Penrith
- Penrith Health and Education Precinct
- Riverlink Precinct
- St Clair,
- St Marys / St Marys North, and
- Sydney Science Park.

Penrith Development Control Plan 2014 may be accessed at https://www.penrithcity.nsw.gov.au/Building-and-Development/Planning-and-Zoning/Planning-Controls/Development-Control-Plans/

* Penrith City Centre Controls

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

See Part 8 of Penrith Local Environmental Plan 2010 and Chapter E11 of Penrith Development Control Plan 2014 for specific controls relating to Penrith City Centre (which includes the subject property).

* Active Street Frontage

The land is identified as an "Active Street Frontage" on the Penrith Local Environmental Plan 2010 (PLEP 2010) Active Street Frontages Map. See Clause 7.8 of PLEP 2010 for details.

Alan Stoneham
General Manager

PER _____

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

Property No: 320469
Your Reference: 52151 post
Contact No: 82450300

Issue Date: 10/11/2016
Certificate No: 16/05759
Receipt Date: 10/11/2016
Receipt No: 2617402

Issued to: K Yeung
1/50 Margaret Street
SYDNEY NSW 2000

PRECINCT 2010

DESCRIPTION OF LAND

County: CUMBERLAND **Parish: CASTLEREAGH**

Location: 142 Henry Street PENRITH NSW 2750
Land Description: Lot 10 DP 553665

- PART 1 PRESCRIBED MATTERS –

In accordance with the provisions of Section 149(2) of the Act the following information is furnished in respect of the abovementioned land:

1 ***NAMES OF RELEVANT PLANNING INSTRUMENTS AND DCPs***

1(1) The name of each environmental planning instrument that applies to the carrying out of development on the land:

Penrith Local Environmental Plan 2010, published 22nd September 2010, as amended, applies to the land.

Sydney Regional Environmental Plan No.9 - Extractive Industry (No.2), gazetted 15 September 1995, as amended, applies to the local government area of Penrith.

Sydney Regional Environmental Plan No. 20 - Hawkesbury-Nepean River (No. 2 - 1997), gazetted 7 November 1997, as amended, applies to the local government area of Penrith (except land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies).

The following State environmental planning policies apply to the land (subject to the exclusions noted below):
State Environmental Planning Policy No.1 - Development Standards. (Note: This policy does not apply to the land to which Penrith Local Environmental Plan 2010 or State Environmental Planning Policy (Western Sydney Employment Area) 2009 apply.)
State Environmental Planning Policy No.19 - Bushland in Urban Areas. (Note: This policy does not apply to certain land referred to in the National Parks and Wildlife Act 1974 and the Forestry Act 1916.)
State Environmental Planning Policy No.21 - Caravan Parks.
State Environmental Planning Policy No.30 - Intensive Agriculture.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

State Environmental Planning Policy No.32 - Urban Consolidation (Redevelopment of Urban Land). (Note: This policy does not apply to land identified as coastal protection, environmental protection, escarpment, floodway, natural hazard, non-urban, rural, rural residential, water catchment or wetland.)
State Environmental Planning Policy No.33 - Hazardous and Offensive Development.
State Environmental Planning Policy No.50 - Canal Estate Development. (Note: This policy does not apply to the land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies.
State Environmental Planning Policy No.55 - Remediation of Land.
State Environmental Planning Policy No.62 - Sustainable Aquaculture.
State Environmental Planning Policy No.64 - Advertising and Signage.
State Environmental Planning Policy No.65 - Design Quality of Residential Apartment Development.
State Environmental Planning Policy No.70 - Affordable Housing (Revised Schemes).
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 (Note: This policy applies to land within New South Wales that is land zoned primarily for urban purposes or land that adjoins land zoned primarily for urban purposes, but only as detailed in clause 4 of the policy.)
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004.
State Environmental Planning Policy (Major Development) 2005.
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.
State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007.
State Environmental Planning Policy (Infrastructure) 2007.
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.
State Environmental Planning Policy (Affordable Rental Housing) 2009.
State Environmental Planning Policy (State and Regional Development) 2011.

1(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act:

The Planning Proposal for Penrith City Park seeks to amend Penrith Local Environmental Plan 2010 to rezone certain land in Station Street and Henry Street to B4 Mixed Use to expand the range of land uses within the vicinity of the future Penrith City Park. See www.penrithcity.nsw.gov.au <http://www.penrithcity.nsw.gov.au> for more information.

Draft State Environmental Planning Policy (Infrastructure) Amendment (Shooting Ranges) 2013 applies to the land.

1(3) The name of each development control plan that applies to the carrying out of development on the land:

Penrith Development Control Plan 2014 applies to the land.

2 *ZONING AND LAND USE UNDER RELEVANT LEPs*

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone (however described):

2(a)-(d) the identity of the zone; the purposes that may be carried out without development consent; the purposes that may not be carried out except with development consent; and the purposes that are prohibited within the zone. Any zone(s) applying to the land is/are listed below and/or in annexures.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

(Note: If no zoning appears in this section see section 1(1) for zoning and land use details (under the Sydney Regional Environmental Plan or State Environmental Planning Policy that zones this property).)

Zone B3 Commercial Core
(Penrith Local Environmental Plan 2010)

1 Objectives of zone

- To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
- To encourage appropriate employment opportunities in accessible locations.
- To maximise public transport patronage and encourage walking and cycling.
- To strengthen the role of Penrith City Centre as the business, retail and cultural centre for the region.

2 Permitted without consent

Nil

3 Permitted with consent

Amusement centres; Car parks; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Function centres; Helipads; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads: Sex services premises; Signage; Tourist and visitor accommodation; Veterinary hospitals

4 Prohibited

Bed and breakfast accommodation; Farm stay accommodation; Any other development not specified in item 2 or 3

Flood planning

All or part of the subject land is identified in Penrith Local Environmental Plan 2010 (PLEP 2010) Clause 7.2 Flood Planning. Development consent is required for any development on land to which Clause 7.2 of PLEP 2010 applies.

Additional information relating to Penrith Local Environmental Plan 2010

Note 1: Under the terms of Clause 2.4 of Penrith Local Environmental Plan 2010 development may be carried out on unzoned land only with development consent.

Note 2: Under the terms of Clause 2.6 of Penrith Local Environmental Plan 2010 land may be subdivided but only with development consent, except for the exclusions detailed in the clause.

Note 3: Under the terms of Clause 2.7 of Penrith Local Environmental Plan 2010 the demolition of a building or work may be carried out only with development consent.

Note 4: A temporary use may be permitted with development consent subject to the requirements of Clause 2.8 of Penrith Local Environmental Plan 2010.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

Note 5: Under the terms of Clause 4.1A of Penrith Local Environmental Plan 2010, despite any other provision of this plan, development consent must not be granted for dual occupancy on an internal lot in Zone R2 Low Density Residential.

Note 6: Under the terms of Clause 5.1 of Penrith Local Environmental Plan 2010 development on land acquired by an authority of the State under the owner-initiated acquisition provisions may, before it is used for the purpose for which it is reserved, be carried out, with development consent, for any purpose.

Note 7: Under the terms of Clause 5.3 of Penrith Local Environmental Plan 2010 development consent may be granted to development of certain land for any purpose that may be carried out in an adjoining zone.

Note 8: Under the terms of Clause 5.9 of Penrith Local Environmental Plan 2010 trees or other vegetation subject to relevant sections of Penrith Development Control Plan 2014 must not be ringbarked, cut down, topped, lopped, removed, injured or wilfully destroyed without the authority conferred by a development consent or a Council permit.

Note 9: Under the terms of Clause 5.9AA of Penrith Local Environmental Plan 2010 (PLEP 2010) any tree or other vegetation that is not of a species or kind prescribed for the purposes of Clause 5.9 of PLEP 2010 by Penrith Development Control Plan 2014 may be ringbarked, cut down, topped, lopped, removed, injured or destroyed without development consent.

Note 10: Clause 5.10 of Penrith Local Environmental Plan 2010 details when development consent is required/not required in relation to heritage conservation.

Note 11: Under the terms of Clause 5.11 of Penrith Local Environmental Plan 2010 bush fire hazard reduction work authorised by the *Rural Fires Act 1997* may be carried out on any land without development consent.

Note 12: Under the terms of Clause 7.1 of Penrith Local Environmental Plan 2010 (PLEP 2010) development consent is required for earthworks unless the work is exempt development under PLEP 2010 or another applicable environmental planning instrument, or the work is ancillary to other development for which development consent has been given.

Note 13: Sex services premises and restricted premises may only be permitted subject to the requirements of Clause 7.23 of Penrith Local Environmental Plan 2010.

Under the provisions of the Planning Proposal for the Penrith City Park, the land is affected by the following draft zone:

Zone B4 Mixed Use

1 Objectives of zone

- To provide a mixture of compatible land uses.
- To integrate suitable business, office, residential, retail and other development in accessible locations so as to maximise public transport patronage and encourage walking and cycling.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- To minimise conflict between land uses within the zone and land uses within adjoining zones.
- To create opportunities to improve public amenity.
- To provide a wide range of retail, business, office, residential, community and other suitable land uses.

2 Permitted without consent

Home occupations

3 Permitted with consent

Amusement centres; Boarding houses; Car parks; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Function centres; Home-based child care; Home businesses; Hostels; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Multi dwelling housing; Passenger transport facilities; Places of public worship; Public administration buildings; Recreation areas; Recreation facilities (indoor); Recreation facilities (outdoor); Registered clubs; Residential accommodation; Residential flat buildings; Respite day care centres; Restricted premises; Roads; Seniors housing; Serviced apartments; Sex services premises; Shop top housing; Signage; Veterinary hospitals.

4 Prohibited

Rural workers' dwellings; Any development not specified in item 2 or 3

2(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed:

(Information is provided in this section only if any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed.)

2(f) whether the land includes or comprises critical habitat:

(Information is provided in this section only if the land includes or comprises critical habitat.)

2(g) whether the land is in a conservation area (however described):

(Information is provided in this section only if the land is in a conservation area (however described).)

2(h) whether an item of environmental heritage (however described) is situated on the land:

(Information is provided in this section only if an item of environmental heritage (however described) is situated on the land.)

2A ZONING AND LAND USE UNDER STATE ENVIRONMENTAL PLANNING POLICY (SYDNEY REGION GROWTH CENTRES) 2006

(Information is provided in this section only if the land is within any zone under State Environmental Planning Policy (Sydney Region Growth Centres) 2006.)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

3 *COMPLYING DEVELOPMENT*

GENERAL HOUSING CODE

(The General Housing Code only applies if the land is within Zones R1, R2, R3, R4 or RU5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the General Housing Code **may** be carried out on the land if the land is within one of the abovementioned zones.

RURAL HOUSING CODE

(The Rural Housing Code only applies if the land is within Zones RU1, RU2, RU3, RU4, RU6 or R5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the Rural Housing Code **may** be carried out on the land if the land is within one of the abovementioned zones.

HOUSING ALTERATIONS CODE

Complying development under the Housing Alterations Code **may** be carried out on the land.

GENERAL DEVELOPMENT CODE

Complying development under the General Development Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL ALTERATIONS CODE

Complying development under the Commercial and Industrial Alterations Code **may** be carried out on the land.

SUBDIVISIONS CODE

Complying development under the Subdivisions Code **may** be carried out on the land.

DEMOLITION CODE

Complying development under the Demolition Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL (NEW BUILDINGS AND ADDITIONS) CODE

(The Commercial and Industrial (New Buildings and Additions) Code only applies if the land is within Zones B1, B2, B3, B4, B5, B6, B7, B8, IN1, IN2, IN3, IN4 or SP3 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the Commercial and Industrial (New Buildings and Alterations) Code **may** be carried out on the land if the land is within one of the abovementioned zones.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

FIRE SAFETY CODE

Complying development under the Fire Safety Code **may** be carried out on the land.

(NOTE: (1) Council has relied on Planning and Infrastructure Circulars and Fact Sheets in the preparation of this information. Applicants should seek their own legal advice in relation to this matter with particular reference to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

(2) Penrith Local Environmental Plan 2010 (if it applies to the land) contains additional complying development not specified in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.)

4 COASTAL PROTECTION

The land is not affected by the operation of sections 38 or 39 of the Coastal Protection Act 1979, to the extent that council has been so notified by the Department of Public Works.

5 MINE SUBSIDENCE

The land is not proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

6 ROAD WIDENING AND ROAD REALIGNMENT

The land is not affected by any road widening or road realignment under:
(a) Division 2 of Part 3 of the Roads Act 1993, or
(b) an environmental planning instrument, or
(c) a resolution of council.

7 COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS

(a) Council Policies

The land is affected by the Asbestos Policy adopted by Council.
The land is not affected by any other policy adopted by the council that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

(b) Other Public Authority Policies

The Bush Fire Co-ordinating Committee has adopted a Bush Fire Risk Management Plan that covers the local government area of Penrith City Council, and includes public, private and Commonwealth lands.
The land is not affected by a policy adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council, that restricts the development of the land because of the likelihood of land slip, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

7A FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION

(1) Development on the land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) (if such uses are permissible on the land) is subject to flood related development controls.

(2) Development on the land or part of the land for industrial or commercial purposes (if such uses are permissible on the land) is subject to flood related development controls.
Development on the land or part of the land for purposes other than industrial or commercial, or for purposes other than those referred to in (1) above, will be considered on a merits based approach and flood related development controls may apply.

Note: The land is subject to Penrith Development Control Plan 2014 Section C3.5 Flood Planning. On application and payment of the prescribed fee Council may be able to provide in writing a range of advice in regard to the extent of flooding affecting the property.

8 LAND RESERVED FOR ACQUISITION

No environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

9 CONTRIBUTIONS PLANS

The Cultural Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith.

The Penrith City Local Open Space Development Contributions Plan 2007 applies anywhere residential development is permitted within the City of Penrith, excluding industrial areas and the release areas identified in Appendix B of the Plan (Penrith Lakes, Cranebrook, Sydney Regional Environmental Plan No. 30 - St Marys, Waterside, Thornton, the WELL Precinct, Glenmore Park and Erskine Park). See
<http://www.penrithcity.nsw.gov.au/uploadedFiles/Content/Website/Our_Services/Planning_and_Development/Planning__Zoning_Information/Local_Planning_Documents/LocalOpenSpaceDCP(1).pdf>

The Penrith City District Open Space Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith, with the exclusion of industrial lands and the Penrith Lakes development site.

The Penrith City Centre Civic Improvement Plan applies to the land.

9A BIODIVERSITY CERTIFIED LAND

(Information is provided in this section only if the land is biodiversity certified land (within the meaning of Part 7AA of the *Threatened Species Conservation Act 1995*).)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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10 BIOBANKING AGREEMENTS

(Information is provided in this section only if Council has been notified by the Director-General of the Department of Environment, Climate Change and Water that the land is land to which a biobanking agreement under Part 7A of the *Threatened Species Conservation Act 1995* relates.)

11 BUSH FIRE PRONE LAND

The land is not identified as bush fire prone land according to Council records.

12 PROPERTY VEGETATION PLANS

(Information is provided in this section only if Council has been notified that the land is land to which a property vegetation plan under the Native Vegetation Act 2003 applies.)

13 ORDERS UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006

(Information is provided in this section only if Council has been notified that an order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land.)

14 DIRECTIONS UNDER PART 3A

(Information is provided in this section only if there is a direction by the Minister in force under section 75P(2)(c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect.)

15 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS AFFECTING SENIORS HOUSING

(Information is provided in this section only if:

(a) there is a current site compatibility certificate (seniors housing), of which the council is aware, issued under State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.)

16 SITE COMPATIBILITY CERTIFICATES FOR INFRASTRUCTURE

(Information is provided in this section only if there is a valid site compatibility certificate (infrastructure), of which council is aware, in respect of proposed development on the land.)

17 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR AFFORDABLE RENTAL HOUSING

(Information is provided in this section only if:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

(a) there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 17(1) or 37(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 have been imposed as a condition of consent to a development application in respect of the land.)

18 PAPER SUBDIVISION INFORMATION

(Information is provided in this section only if a development plan adopted by a relevant authority applies to the land or is proposed to be subject to a consent ballot, or a subdivision order applies to the land.)

19 SITE VERIFICATION CERTIFICATES

(Information is provided in this section only if there is a current site verification certificate, of which council is aware, in respect of the land.)

NOTE: The following matters are prescribed by section 59(2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate

(a) (Information is provided in this section only if, as at the date of this certificate, the land (or part of the land) is significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.)

(b) (Information is provided in this section only if, as at the date of this certificate, the land is subject to a management order within the meaning of the Contaminated Land Management Act 1997.)

(c) (Information is provided in this section only if, as at the date of this certificate, the land is the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.)

(d) (Information is provided in this section only if, at the date of this certificate, the land subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.)

(e) (Information is provided in this section only if the land is the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997 – a copy of which has been provided to Council.)

Note: Section 149(5) information for this property may contain additional information regarding contamination issues.

Note: The Environmental Planning and Assessment Amendment Act 1997 commenced operation on the 1 July 1998. As a consequence of this Act the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment (Amendment) Regulation 1998, Environmental Planning and Assessment (Further Amendment) Regulation 1998 and Environmental Planning and Assessment (Savings and Transitional) Regulation 1998 and Environmental Planning and Assessment Regulation 2000.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

Information is provided only to the extent that Council has been notified by relevant government departments.

149(5) Certificate
This Certificate is directed to the following relevant matters affecting the land

When information pursuant to section 149(5) is requested the Council is under no obligation to furnish any of the information supplied herein pursuant to that section. Council draws your attention to section 149(6) which states that a council shall not incur any liability in respect of any advice provided in good faith pursuant to sub-section (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate.

Note:

- Council's 149(5) information does not include development consent or easement information. Details of development consents may be obtained by making enquiries with Council's Development Services Department pursuant to section 12 of the Local Government Act 1993 or (for development applications lodged after January 2007) by viewing the Online Services area at www.penrithcity.nsw.gov.au . Details of any easements may be obtained from a Title Search at Land and Property Information New South Wales.
- This certificate does not contain information relating to Complying Development Certificates.
- This certificate may not provide full details of development rights over the land.
-

* Threatened Species Conservation Act 1995

When considering any development application Council must have regard to the Threatened Species Conservation Act 1995. Please note that this legislation may have application to any land throughout the city. Interested persons should make their own enquiries in regard to the impact that this legislation could have on this land.

* Preservation of Trees and Vegetation

See Clauses 5.9 and 5.9AA of Penrith Local Environmental Plan 2010 and Chapter C2 of Penrith Development Control Plan 2014 for specific controls relating to the preservation of trees and vegetation.

* Development Control Plan General Information

Penrith Development Control Plan 2014 which applies to the land, sets out requirements for a range of issues that apply across the Penrith Local Government Area, including:

- Site Planning and Design Principles
- Vegetation Management
- Water Management
- Land Management
- Waste Management
- Landscape Design
- Culture and Heritage
- Public Domain
- Advertising and Signage
- Transport, Access and Parking
- Subdivision
- Noise and Vibration, and
- Infrastructure and Services.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

The Development Control Plan also specifies requirements relating to various types of land uses including:

- Rural Land Uses
- Residential Development
- Commercial and Retail Development, and
- Industrial Development

as well as for a number of specific activities, including child care centres; health consulting rooms; educational establishments; parent friendly amenities; places of public worship; vehicle repair stations; cemeteries, crematoria and funeral homes; extractive industries; and telecommunication facilities.
The Development Control Plan also details requirements relating to key precincts within the Penrith Local Government Area, including:

- Caddens
- Claremont Meadows Stage 2
- Cranebrook
- Emu Heights
- Emu Plains
- Erskine Business Park
- Glenmore Park
- Kingswood
- Mulgoa Valley
- Orchard Hills
- Penrith
- Penrith Health and Education Precinct
- Riverlink Precinct
- St Clair,
- St Marys / St Marys North, and
- Sydney Science Park.

Penrith Development Control Plan 2014 may be accessed at https://www.penrithcity.nsw.gov.au/Building-and-Development/Planning-and-Zoning/Planning-Controls/Development-Control-Plans/

* Penrith City Centre Controls

See Part 8 of Penrith Local Environmental Plan 2010 and Chapter E11 of Penrith Development Control Plan 2014 for specific controls relating to Penrith City Centre (which includes the subject property).

* Active Street Frontage

The land is identified as an "Active Street Frontage" on the Penrith Local Environmental Plan 2010 (PLEP 2010) Active Street Frontages Map. See Clause 7.8 of PLEP 2010 for details.

Alan Stoneham
General Manager

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

Property No: 319961
Your Reference: Penrith City Council PSI Post
Contact No: 99791722

Issue Date: 10/06/2016
Certificate No: 16/02821
Receipt Date: 8/06/2016
Receipt No: 2600810

Issued to: Tim Gunns
2309/4 Daydream Street
WARRIEWOOD NSW 2102

PRECINCT 2010

DESCRIPTION OF LAND

County: CUMBERLAND **Parish: CASTLEREAGH**

Location: 134-138 Henry Street PENRITH NSW 2750
Land Description: Lot 1 DP 164798

- PART 1 PRESCRIBED MATTERS –

In accordance with the provisions of Section 149(2) of the Act the following information is furnished in respect of the abovementioned land:

1 *NAMES OF RELEVANT PLANNING INSTRUMENTS AND DCPs*

1(1) The name of each environmental planning instrument that applies to the carrying out of development on the land:

Penrith Local Environmental Plan 2010, published 22nd September 2010, as amended, applies to the land.

Sydney Regional Environmental Plan No.9 - Extractive Industry (No.2), gazetted 15 September 1995, as amended, applies to the local government area of Penrith.

Sydney Regional Environmental Plan No. 20 - Hawkesbury-Nepean River (No. 2 - 1997), gazetted 7 November 1997, as amended, applies to the local government area of Penrith (except land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies).

The following State environmental planning policies apply to the land (subject to the exclusions noted below):
State Environmental Planning Policy No.1 - Development Standards. (Note: This policy does not apply to the land to which Penrith Local Environmental Plan 2010 or State Environmental Planning Policy (Western Sydney Employment Area) 2009 apply.)
State Environmental Planning Policy No.19 - Bushland in Urban Areas. (Note: This policy does not apply to certain land referred to in the National Parks and Wildlife Act 1974 and the Forestry Act 1916.)
State Environmental Planning Policy No.21 - Caravan Parks.
State Environmental Planning Policy No.30 - Intensive Agriculture.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Environmental Planning and Assessment Act, 1979

State Environmental Planning Policy No.32 - Urban Consolidation (Redevelopment of Urban Land). (Note: This policy does not apply to land identified as coastal protection, environmental protection, escarpment, floodway, natural hazard, non-urban, rural, rural residential, water catchment or wetland.)
State Environmental Planning Policy No.33 - Hazardous and Offensive Development.
State Environmental Planning Policy No.50 - Canal Estate Development. (Note: This policy does not apply to the land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies.
State Environmental Planning Policy No.55 - Remediation of Land.
State Environmental Planning Policy No.62 - Sustainable Aquaculture.
State Environmental Planning Policy No.64 - Advertising and Signage.
State Environmental Planning Policy No.65 - Design Quality of Residential Apartment Development.
State Environmental Planning Policy No.70 - Affordable Housing (Revised Schemes).
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 (Note: This policy applies to land within New South Wales that is land zoned primarily for urban purposes or land that adjoins land zoned primarily for urban purposes, but only as detailed in clause 4 of the policy.)
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004.
State Environmental Planning Policy (Major Development) 2005.
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.
State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007.
State Environmental Planning Policy (Infrastructure) 2007.
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.
State Environmental Planning Policy (Affordable Rental Housing) 2009.
State Environmental Planning Policy (State and Regional Development) 2011.

1(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act:

The Planning Proposal for Penrith City Park seeks to amend Penrith Local Environmental Plan 2010 to rezone certain land in Station Street and Henry Street to B4 Mixed Use to expand the range of land uses within the vicinity of the future Penrith City Park. See www.penrithcity.nsw.gov.au <http://www.penrithcity.nsw.gov.au> for more information.

Draft State Environmental Planning Policy (Infrastructure) Amendment (Shooting Ranges) 2013 applies to the land.

1(3) The name of each development control plan that applies to the carrying out of development on the land:

Penrith Development Control Plan 2014 applies to the land.

2 *ZONING AND LAND USE UNDER RELEVANT LEPs*

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone (however described):

2(a)-(d) the identity of the zone; the purposes that may be carried out without development consent; the purposes that may not be carried out except with development consent; and the purposes that are prohibited within the zone. Any zone(s) applying to the land is/are listed below and/or in annexures.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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(Note: If no zoning appears in this section see section 1(1) for zoning and land use details (under the Sydney Regional Environmental Plan or State Environmental Planning Policy that zones this property).)

Zone B3 Commercial Core
(Penrith Local Environmental Plan 2010)

1 Objectives of zone

- To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
- To encourage appropriate employment opportunities in accessible locations.
- To maximise public transport patronage and encourage walking and cycling.
- To strengthen the role of Penrith City Centre as the business, retail and cultural centre for the region.

2 Permitted without consent

Nil

3 Permitted with consent

Amusement centres; Car parks; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Function centres; Helipads; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads: Sex services premises; Signage; Tourist and visitor accommodation; Veterinary hospitals

4 Prohibited

Bed and breakfast accommodation; Farm stay accommodation; Any other development not specified in item 2 or 3

Flood planning

All or part of the subject land is identified in Penrith Local Environmental Plan 2010 (PLEP 2010) Clause 7.2 Flood Planning. Development consent is required for any development on land to which Clause 7.2 of PLEP 2010 applies.

Additional information relating to Penrith Local Environmental Plan 2010

Note 1: Under the terms of Clause 2.4 of Penrith Local Environmental Plan 2010 development may be carried out on unzoned land only with development consent.

Note 2: Under the terms of Clause 2.6 of Penrith Local Environmental Plan 2010 land may be subdivided but only with development consent, except for the exclusions detailed in the clause.

Note 3: Under the terms of Clause 2.7 of Penrith Local Environmental Plan 2010 the demolition of a building or work may be carried out only with development consent.

Note 4: A temporary use may be permitted with development consent subject to the requirements of Clause 2.8 of Penrith Local Environmental Plan 2010.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Note 5: Under the terms of Clause 4.1A of Penrith Local Environmental Plan 2010, despite any other provision of this plan, development consent must not be granted for dual occupancy on an internal lot in Zone R2 Low Density Residential.

Note 6: Under the terms of Clause 5.1 of Penrith Local Environmental Plan 2010 development on land acquired by an authority of the State under the owner-initiated acquisition provisions may, before it is used for the purpose for which it is reserved, be carried out, with development consent, for any purpose.

Note 7: Under the terms of Clause 5.3 of Penrith Local Environmental Plan 2010 development consent may be granted to development of certain land for any purpose that may be carried out in an adjoining zone.

Note 8: Under the terms of Clause 5.9 of Penrith Local Environmental Plan 2010 trees or other vegetation subject to relevant sections of Penrith Development Control Plan 2014 must not be ringbarked, cut down, topped, lopped, removed, injured or wilfully destroyed without the authority conferred by a development consent or a Council permit.

Note 9: Under the terms of Clause 5.9AA of Penrith Local Environmental Plan 2010 (PLEP 2010) any tree or other vegetation that is not of a species or kind prescribed for the purposes of Clause 5.9 of PLEP 2010 by Penrith Development Control Plan 2014 may be ringbarked, cut down, topped, lopped, removed, injured or destroyed without development consent.

Note 10: Clause 5.10 of Penrith Local Environmental Plan 2010 details when development consent is required/not required in relation to heritage conservation.

Note 11: Under the terms of Clause 5.11 of Penrith Local Environmental Plan 2010 bush fire hazard reduction work authorised by the *Rural Fires Act 1997* may be carried out on any land without development consent.

Note 12: Under the terms of Clause 7.1 of Penrith Local Environmental Plan 2010 (PLEP 2010) development consent is required for earthworks unless the work is exempt development under PLEP 2010 or another applicable environmental planning instrument, or the work is ancillary to other development for which development consent has been given.

Note 13: Sex services premises and restricted premises may only be permitted subject to the requirements of Clause 7.23 of Penrith Local Environmental Plan 2010.

2(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed:

(Information is provided in this section only if any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed.)

2(f) whether the land includes or comprises critical habitat:

(Information is provided in this section only if the land includes or comprises critical habitat.)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

2(g) whether the land is in a conservation area (however described):

(Information is provided in this section only if the land is in a conservation area (however described).)

2(h) whether an item of environmental heritage (however described) is situated on the land:

(Information is provided in this section only if an item of environmental heritage (however described) is situated on the land.)

2A ZONING AND LAND USE UNDER STATE ENVIRONMENTAL PLANNING POLICY (SYDNEY REGION GROWTH CENTRES) 2006

(Information is provided in this section only if the land is within any zone under State Environmental Planning Policy (Sydney Region Growth Centres) 2006.)

3 COMPLYING DEVELOPMENT

GENERAL HOUSING CODE

(The General Housing Code only applies if the land is within Zones R1, R2, R3, R4 or RU5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the General Housing Code **may** be carried out on the land if the land is within one of the abovementioned zones.

RURAL HOUSING CODE

(The Rural Housing Code only applies if the land is within Zones RU1, RU2, RU3, RU4, RU6 or R5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the Rural Housing Code **may** be carried out on the land if the land is within one of the abovementioned zones.

HOUSING ALTERATIONS CODE

Complying development under the Housing Alterations Code **may** be carried out on the land.

GENERAL DEVELOPMENT CODE

Complying development under the General Development Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL ALTERATIONS CODE

Complying development under the Commercial and Industrial Alterations Code **may** be carried out on the land.

SUBDIVISIONS CODE

Complying development under the Subdivisions Code **may** be carried out on the land.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Environmental Planning and Assessment Act, 1979

DEMOLITION CODE

Complying development under the Demolition Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL (NEW BUILDINGS AND ADDITIONS) CODE

(The Commercial and Industrial (New Buildings and Additions) Code only applies if the land is within Zones B1, B2, B3, B4, B5, B6, B7, B8, IN1, IN2, IN3, IN4 or SP3 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the Commercial and Industrial (New Buildings and Alterations) Code **may** be carried out on the land if the land is within one of the abovementioned zones.

FIRE SAFETY CODE

Complying development under the Fire Safety Code **may** be carried out on the land.

(NOTE: (1) Council has relied on Planning and Infrastructure Circulars and Fact Sheets in the preparation of this information. Applicants should seek their own legal advice in relation to this matter with particular reference to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

(2) Penrith Local Environmental Plan 2010 (if it applies to the land) contains additional complying development not specified in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.)

4 COASTAL PROTECTION

The land is not affected by the operation of sections 38 or 39 of the Coastal Protection Act 1979, to the extent that council has been so notified by the Department of Public Works.

5 MINE SUBSIDENCE

The land is not proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

6 ROAD WIDENING AND ROAD REALIGNMENT

The land is not affected by any road widening or road realignment under:
(a) Division 2 of Part 3 of the Roads Act 1993, or
(b) an environmental planning instrument, or
(c) a resolution of council.

7 COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS

(a) Council Policies
The land is affected by the Asbestos Policy adopted by Council.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

The land is not affected by any other policy adopted by the council that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

(b) Other Public Authority Policies

The Bush Fire Co-ordinating Committee has adopted a Bush Fire Risk Management Plan that covers the local government area of Penrith City Council, and includes public, private and Commonwealth lands.

The land is not affected by a policy adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council, that restricts the development of the land because of the likelihood of land slip, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

7A FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION

(1) Development on the land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) (if such uses are permissible on the land) is subject to flood related development controls.

(2) Development on the land or part of the land for industrial or commercial purposes (if such uses are permissible on the land) is subject to flood related development controls.

Development on the land or part of the land for purposes other than industrial or commercial, or for purposes other than those referred to in (1) above, will be considered on a merits based approach and flood related development controls may apply.

Note: The land is subject to Penrith Development Control Plan 2014 Section C3.5 Flood Planning. On application and payment of the prescribed fee Council may be able to provide in writing a range of advice in regard to the extent of flooding affecting the property.

8 LAND RESERVED FOR ACQUISITION

No environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

9 CONTRIBUTIONS PLANS

The Cultural Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith.

The Penrith City Local Open Space Development Contributions Plan 2007 applies anywhere residential development is permitted within the City of Penrith, excluding industrial areas and the release areas identified in Appendix B of the Plan (Penrith Lakes, Cranebrook, Sydney Regional Environmental Plan No. 30 - St Marys, Waterside, Thornton, the WELL Precinct, Glenmore Park and Erskine Park). See <http://www.penrithcity.nsw.gov.au/uploadedFiles/Content/Website/Our_Services/Planning_and_Development/Planning__Zoning_Information/Local_Planning_Documents/LocalOpenSpaceDCP(1).pdf>

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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The Penrith City District Open Space Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith, with the exclusion of industrial lands and the Penrith Lakes development site.

The Penrith City Centre Civic Improvement Plan applies to the land.

9A BIODIVERSITY CERTIFIED LAND

(Information is provided in this section only if the land is biodiversity certified land (within the meaning of Part 7AA of the *Threatened Species Conservation Act 1995*).)

10 BIOBANKING AGREEMENTS

(Information is provided in this section only if Council has been notified by the Director-General of the Department of Environment, Climate Change and Water that the land is land to which a biobanking agreement under Part 7A of the *Threatened Species Conservation Act 1995* relates.)

11 BUSH FIRE PRONE LAND

The land is not identified as bush fire prone land according to Council records.

12 PROPERTY VEGETATION PLANS

(Information is provided in this section only if Council has been notified that the land is land to which a property vegetation plan under the Native Vegetation Act 2003 applies.)

13 ORDERS UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006

(Information is provided in this section only if Council has been notified that an order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land.)

14 DIRECTIONS UNDER PART 3A

(Information is provided in this section only if there is a direction by the Minister in force under section 75P(2)(c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect.)

15 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS AFFECTING SENIORS HOUSING

(Information is provided in this section only if:

(a) there is a current site compatibility certificate (seniors housing), of which the council is aware, issued under State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

16 SITE COMPATIBILITY CERTIFICATES FOR INFRASTRUCTURE

(Information is provided in this section only if there is a valid site compatibility certificate (infrastructure), of which council is aware, in respect of proposed development on the land.)

17 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR AFFORDABLE RENTAL HOUSING

(Information is provided in this section only if:

(a) there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 17(1) or 37(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 have been imposed as a condition of consent to a development application in respect of the land.)

18 PAPER SUBDIVISION INFORMATION

(Information is provided in this section only if a development plan adopted by a relevant authority applies to the land or is proposed to be subject to a consent ballot, or a subdivision order applies to the land.)

19 SITE VERIFICATION CERTIFICATES

(Information is provided in this section only if there is a current site verification certificate, of which council is aware, in respect of the land.)

NOTE: The following matters are prescribed by section 59(2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate

(a) (Information is provided in this section only if, as at the date of this certificate, the land (or part of the land) is significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.)

(b) (Information is provided in this section only if, as at the date of this certificate, the land is subject to a management order within the meaning of the Contaminated Land Management Act 1997.)

(c) (Information is provided in this section only if, as at the date of this certificate, the land is the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.)

(d) (Information is provided in this section only if, at the date of this certificate, the land subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.)

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Version: 1, Version Date: 14/04/2021

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(e) (Information is provided in this section only if the land is the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997 – a copy of which has been provided to Council.)

Note: Section 149(5) information for this property may contain additional information regarding contamination issues.

Note: The Environmental Planning and Assessment Amendment Act 1997 commenced operation on the 1 July 1998. As a consequence of this Act the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment (Amendment) Regulation 1998, Environmental Planning and Assessment (Further Amendment) Regulation 1998 and Environmental Planning and Assessment (Savings and Transitional) Regulation 1998 and Environmental Planning and Assessment Regulation 2000.

Information is provided only to the extent that Council has been notified by relevant government departments.

149(5) Certificate
This Certificate is directed to the following relevant matters affecting the land

When information pursuant to section 149(5) is requested the Council is under no obligation to furnish any of the information supplied herein pursuant to that section. Council draws your attention to section 149(6) which states that a council shall not incur any liability in respect of any advice provided in good faith pursuant to sub-section (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate.

Note:

- Council's 149(5) information does not include development consent or easement information. Details of development consents may be obtained by making enquiries with Council's Development Services Department pursuant to section 12 of the Local Government Act 1993 or (for development applications lodged after January 2007) by viewing the Online Services area at www.penrithcity.nsw.gov.au . Details of any easements may be obtained from a Title Search at Land and Property Information New South Wales.
- This certificate does not contain information relating to Complying Development Certificates.
- This certificate may not provide full details of development rights over the land.

* Threatened Species Conservation Act 1995
When considering any development application Council must have regard to the Threatened Species Conservation Act 1995. Please note that this legislation may have application to any land throughout the city. Interested persons should make their own enquiries in regard to the impact that this legislation could have on this land.

* Preservation of Trees and Vegetation
See Clauses 5.9 and 5.9AA of Penrith Local Environmental Plan 2010 and Chapter C2 of Penrith Development Control Plan 2014 for specific controls relating to the preservation of trees and vegetation.

* Development Control Plan General Information
Penrith Development Control Plan 2014 which applies to the land, sets out requirements for a range of issues that apply across the Penrith Local Government Area, including:

- Site Planning and Design Principles

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Vegetation Management
- Water Management
- Land Management
- Waste Management
- Landscape Design
- Culture and Heritage
- Public Domain
- Advertising and Signage
- Transport, Access and Parking
- Subdivision
- Noise and Vibration, and
- Infrastructure and Services.

The Development Control Plan also specifies requirements relating to various types of land uses including:

- Rural Land Uses
- Residential Development
- Commercial and Retail Development, and
- Industrial Development

as well as for a number of specific activities, including child care centres; health consulting rooms; educational establishments; parent friendly amenities; places of public worship; vehicle repair stations; cemeteries, crematoria and funeral homes; extractive industries; and telecommunication facilities.
The Development Control Plan also details requirements relating to key precincts within the Penrith Local Government Area, including:

- Caddens
- Claremont Meadows Stage 2
- Cranebrook
- Emu Heights
- Emu Plains
- Erskine Business Park
- Glenmore Park
- Kingswood
- Mulgoa Valley
- Orchard Hills
- Penrith
- Penrith Health and Education Precinct
- Riverlink Precinct
- St Clair, and
- St Marys / St Marys North.

Penrith Development Control Plan 2014 may be accessed at https://www.penrithcity.nsw.gov.au/Building-and-Development/Planning-and-Zoning/Planning-Controls/Development-Control-Plans/

* Penrith City Centre Controls

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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See Part 8 of Penrith Local Environmental Plan 2010 and Chapter E11 of Penrith Development Control Plan 2014 for specific controls relating to Penrith City Centre (which includes the subject property).

* Active Street Frontage

The land is identified as an "Active Street Frontage" on the Penrith Local Environmental Plan 2010 (PLEP 2010) Active Street Frontages Map. See Clause 7.8 of PLEP 2010 for details.

Alan Stoneham
General Manager

PER

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

Property No: 319961
Your Reference: Penrith Council PS1 Post
Contact No: 99791722

Issue Date: 10/06/2016
Certificate No: 16/02832
Receipt Date: 8/06/2016
Receipt No: 2600810

Issued to: Tim Gunns
2309/4 Daydream St
WARRIEWOOD NSW 2102

PRECINCT 2010

DESCRIPTION OF LAND

County: CUMBERLAND **Parish: CASTLEREAGH**

Location: 134-138 Henry Street PENRITH NSW 2750
Land Description: Lot 1 DP 252457

- PART 1 PRESCRIBED MATTERS –

In accordance with the provisions of Section 149(2) of the Act the following information is furnished in respect of the abovementioned land:

1 *NAMES OF RELEVANT PLANNING INSTRUMENTS AND DCPs*

1(1) The name of each environmental planning instrument that applies to the carrying out of development on the land:

Penrith Local Environmental Plan 2010, published 22nd September 2010, as amended, applies to the land.

Sydney Regional Environmental Plan No.9 - Extractive Industry (No.2), gazetted 15 September 1995, as amended, applies to the local government area of Penrith.

Sydney Regional Environmental Plan No. 20 - Hawkesbury-Nepean River (No. 2 - 1997), gazetted 7 November 1997, as amended, applies to the local government area of Penrith (except land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies).

The following State environmental planning policies apply to the land (subject to the exclusions noted below):
State Environmental Planning Policy No.1 - Development Standards. (Note: This policy does not apply to the land to which Penrith Local Environmental Plan 2010 or State Environmental Planning Policy (Western Sydney Employment Area) 2009 apply.)
State Environmental Planning Policy No.19 - Bushland in Urban Areas. (Note: This policy does not apply to certain land referred to in the National Parks and Wildlife Act 1974 and the Forestry Act 1916.)
State Environmental Planning Policy No.21 - Caravan Parks.
State Environmental Planning Policy No.30 - Intensive Agriculture.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Environmental Planning and Assessment Act, 1979

State Environmental Planning Policy No.32 - Urban Consolidation (Redevelopment of Urban Land). (Note: This policy does not apply to land identified as coastal protection, environmental protection, escarpment, floodway, natural hazard, non-urban, rural, rural residential, water catchment or wetland.)
State Environmental Planning Policy No.33 - Hazardous and Offensive Development.
State Environmental Planning Policy No.50 - Canal Estate Development. (Note: This policy does not apply to the land to which State Environmental Planning Policy (Penrith Lakes Scheme) 1989 applies.
State Environmental Planning Policy No.55 - Remediation of Land.
State Environmental Planning Policy No.62 - Sustainable Aquaculture.
State Environmental Planning Policy No.64 - Advertising and Signage.
State Environmental Planning Policy No.65 - Design Quality of Residential Apartment Development.
State Environmental Planning Policy No.70 - Affordable Housing (Revised Schemes).
State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 (Note: This policy applies to land within New South Wales that is land zoned primarily for urban purposes or land that adjoins land zoned primarily for urban purposes, but only as detailed in clause 4 of the policy.)
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004.
State Environmental Planning Policy (Major Development) 2005.
State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007.
State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007.
State Environmental Planning Policy (Infrastructure) 2007.
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.
State Environmental Planning Policy (Affordable Rental Housing) 2009.
State Environmental Planning Policy (State and Regional Development) 2011.

1(2) The name of each proposed environmental planning instrument that will apply to the carrying out of development on the land and that is or has been the subject of community consultation or on public exhibition under the Act:

The Planning Proposal for Penrith City Park seeks to amend Penrith Local Environmental Plan 2010 to rezone certain land in Station Street and Henry Street to B4 Mixed Use to expand the range of land uses within the vicinity of the future Penrith City Park. See www.penrithcity.nsw.gov.au <http://www.penrithcity.nsw.gov.au> for more information.

Draft State Environmental Planning Policy (Infrastructure) Amendment (Shooting Ranges) 2013 applies to the land.

1(3) The name of each development control plan that applies to the carrying out of development on the land:

Penrith Development Control Plan 2014 applies to the land.

2 *ZONING AND LAND USE UNDER RELEVANT LEPs*

For each environmental planning instrument or proposed instrument referred to in clause 1 (other than a SEPP or proposed SEPP) that includes the land in any zone (however described):

2(a)-(d) the identity of the zone; the purposes that may be carried out without development consent; the purposes that may not be carried out except with development consent; and the purposes that are prohibited within the zone. Any zone(s) applying to the land is/are listed below and/or in annexures.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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(Note: If no zoning appears in this section see section 1(1) for zoning and land use details (under the Sydney Regional Environmental Plan or State Environmental Planning Policy that zones this property).)

Zone B3 Commercial Core
(Penrith Local Environmental Plan 2010)

1 Objectives of zone

- To provide a wide range of retail, business, office, entertainment, community and other suitable land uses that serve the needs of the local and wider community.
- To encourage appropriate employment opportunities in accessible locations.
- To maximise public transport patronage and encourage walking and cycling.
- To strengthen the role of Penrith City Centre as the business, retail and cultural centre for the region.

2 Permitted without consent

Nil

3 Permitted with consent

Amusement centres; Car parks; Child care centres; Commercial premises; Community facilities; Educational establishments; Entertainment facilities; Environmental facilities; Environmental protection works; Flood mitigation works; Function centres; Helipads; Hotel or motel accommodation; Information and education facilities; Medical centres; Mortuaries; Passenger transport facilities; Places of public worship; Recreation areas; Recreation facilities (indoor); Registered clubs; Respite day care centres; Restricted premises; Roads: Sex services premises; Signage; Tourist and visitor accommodation; Veterinary hospitals

4 Prohibited

Bed and breakfast accommodation; Farm stay accommodation; Any other development not specified in item 2 or 3

Flood planning

All or part of the subject land is identified in Penrith Local Environmental Plan 2010 (PLEP 2010) Clause 7.2 Flood Planning. Development consent is required for any development on land to which Clause 7.2 of PLEP 2010 applies.

Additional information relating to Penrith Local Environmental Plan 2010

Note 1: Under the terms of Clause 2.4 of Penrith Local Environmental Plan 2010 development may be carried out on unzoned land only with development consent.

Note 2: Under the terms of Clause 2.6 of Penrith Local Environmental Plan 2010 land may be subdivided but only with development consent, except for the exclusions detailed in the clause.

Note 3: Under the terms of Clause 2.7 of Penrith Local Environmental Plan 2010 the demolition of a building or work may be carried out only with development consent.

Note 4: A temporary use may be permitted with development consent subject to the requirements of Clause 2.8 of Penrith Local Environmental Plan 2010.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

Note 5: Under the terms of Clause 4.1A of Penrith Local Environmental Plan 2010, despite any other provision of this plan, development consent must not be granted for dual occupancy on an internal lot in Zone R2 Low Density Residential.

Note 6: Under the terms of Clause 5.1 of Penrith Local Environmental Plan 2010 development on land acquired by an authority of the State under the owner-initiated acquisition provisions may, before it is used for the purpose for which it is reserved, be carried out, with development consent, for any purpose.

Note 7: Under the terms of Clause 5.3 of Penrith Local Environmental Plan 2010 development consent may be granted to development of certain land for any purpose that may be carried out in an adjoining zone.

Note 8: Under the terms of Clause 5.9 of Penrith Local Environmental Plan 2010 trees or other vegetation subject to relevant sections of Penrith Development Control Plan 2014 must not be ringbarked, cut down, topped, lopped, removed, injured or wilfully destroyed without the authority conferred by a development consent or a Council permit.

Note 9: Under the terms of Clause 5.9AA of Penrith Local Environmental Plan 2010 (PLEP 2010) any tree or other vegetation that is not of a species or kind prescribed for the purposes of Clause 5.9 of PLEP 2010 by Penrith Development Control Plan 2014 may be ringbarked, cut down, topped, lopped, removed, injured or destroyed without development consent.

Note 10: Clause 5.10 of Penrith Local Environmental Plan 2010 details when development consent is required/not required in relation to heritage conservation.

Note 11: Under the terms of Clause 5.11 of Penrith Local Environmental Plan 2010 bush fire hazard reduction work authorised by the *Rural Fires Act 1997* may be carried out on any land without development consent.

Note 12: Under the terms of Clause 7.1 of Penrith Local Environmental Plan 2010 (PLEP 2010) development consent is required for earthworks unless the work is exempt development under PLEP 2010 or another applicable environmental planning instrument, or the work is ancillary to other development for which development consent has been given.

Note 13: Sex services premises and restricted premises may only be permitted subject to the requirements of Clause 7.23 of Penrith Local Environmental Plan 2010.

2(e) whether any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed:

(Information is provided in this section only if any development standards applying to the land fix minimum land dimensions for the erection of a dwelling-house on the land and, if so, the minimum land dimensions so fixed.)

2(f) whether the land includes or comprises critical habitat:

(Information is provided in this section only if the land includes or comprises critical habitat.)

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2(g) whether the land is in a conservation area (however described):

(Information is provided in this section only if the land is in a conservation area (however described).)

2(h) whether an item of environmental heritage (however described) is situated on the land:

(Information is provided in this section only if an item of environmental heritage (however described) is situated on the land.)

2A ZONING AND LAND USE UNDER STATE ENVIRONMENTAL PLANNING POLICY (SYDNEY REGION GROWTH CENTRES) 2006

(Information is provided in this section only if the land is within any zone under State Environmental Planning Policy (Sydney Region Growth Centres) 2006.)

3 COMPLYING DEVELOPMENT

GENERAL HOUSING CODE
(The General Housing Code only applies if the land is within Zones R1, R2, R3, R4 or RU5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the General Housing Code **may** be carried out on the land if the land is within one of the abovementioned zones.

RURAL HOUSING CODE
(The Rural Housing Code only applies if the land is within Zones RU1, RU2, RU3, RU4, RU6 or R5 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the Rural Housing Code **may** be carried out on the land if the land is within one of the abovementioned zones.

HOUSING ALTERATIONS CODE

Complying development under the Housing Alterations Code **may** be carried out on the land.

GENERAL DEVELOPMENT CODE

Complying development under the General Development Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL ALTERATIONS CODE

Complying development under the Commercial and Industrial Alterations Code **may** be carried out on the land.

SUBDIVISIONS CODE

Complying development under the Subdivisions Code **may** be carried out on the land.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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DEMOLITION CODE

Complying development under the Demolition Code **may** be carried out on the land.

COMMERCIAL AND INDUSTRIAL (NEW BUILDINGS AND ADDITIONS) CODE

(The Commercial and Industrial (New Buildings and Additions) Code only applies if the land is within Zones B1, B2, B3, B4, B5, B6, B7, B8, IN1, IN2, IN3, IN4 or SP3 under Penrith Local Environmental Plan 2010 or an equivalent zone in a non standard template planning instrument.)

Complying development under the Commercial and Industrial (New Buildings and Alterations) Code **may** be carried out on the land if the land is within one of the abovementioned zones.

FIRE SAFETY CODE

Complying development under the Fire Safety Code **may** be carried out on the land.

(NOTE: (1) Council has relied on Planning and Infrastructure Circulars and Fact Sheets in the preparation of this information. Applicants should seek their own legal advice in relation to this matter with particular reference to State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.

(2) Penrith Local Environmental Plan 2010 (if it applies to the land) contains additional complying development not specified in State Environmental Planning Policy (Exempt and Complying Development Codes) 2008.)

4 COASTAL PROTECTION

The land is not affected by the operation of sections 38 or 39 of the Coastal Protection Act 1979, to the extent that council has been so notified by the Department of Public Works.

5 MINE SUBSIDENCE

The land is not proclaimed to be a mine subsidence district within the meaning of section 15 of the Mine Subsidence Compensation Act 1961.

6 ROAD WIDENING AND ROAD REALIGNMENT

The land is not affected by any road widening or road realignment under:
(a) Division 2 of Part 3 of the Roads Act 1993, or
(b) an environmental planning instrument, or
(c) a resolution of council.

7 COUNCIL AND OTHER PUBLIC AUTHORITY POLICIES ON HAZARD RISK RESTRICTIONS

(a) Council Policies
The land is affected by the Asbestos Policy adopted by Council.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

The land is not affected by any other policy adopted by the council that restricts the development of the land because of the likelihood of land slip, bushfire, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

(b) Other Public Authority Policies

The Bush Fire Co-ordinating Committee has adopted a Bush Fire Risk Management Plan that covers the local government area of Penrith City Council, and includes public, private and Commonwealth lands.

The land is not affected by a policy adopted by any other public authority and notified to the council for the express purpose of its adoption by that authority being referred to in planning certificates issued by the council, that restricts the development of the land because of the likelihood of land slip, tidal inundation, subsidence, acid sulphate soils or any other risk (other than flooding).

7A FLOOD RELATED DEVELOPMENT CONTROLS INFORMATION

(1) Development on the land or part of the land for the purposes of dwelling houses, dual occupancies, multi dwelling housing or residential flat buildings (not including development for the purposes of group homes or seniors housing) (if such uses are permissible on the land) is subject to flood related development controls.

(2) Development on the land or part of the land for industrial or commercial purposes (if such uses are permissible on the land) is subject to flood related development controls.

Development on the land or part of the land for purposes other than industrial or commercial, or for purposes other than those referred to in (1) above, will be considered on a merits based approach and flood related development controls may apply.

Note: The land is subject to Penrith Development Control Plan 2014 Section C3.5 Flood Planning. On application and payment of the prescribed fee Council may be able to provide in writing a range of advice in regard to the extent of flooding affecting the property.

8 LAND RESERVED FOR ACQUISITION

No environmental planning instrument or proposed environmental planning instrument referred to in clause 1 makes provision in relation to the acquisition of the land by a public authority, as referred to in section 27 of the Act.

9 CONTRIBUTIONS PLANS

The Cultural Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith.

The Penrith City Local Open Space Development Contributions Plan 2007 applies anywhere residential development is permitted within the City of Penrith, excluding industrial areas and the release areas identified in Appendix B of the Plan (Penrith Lakes, Cranebrook, Sydney Regional Environmental Plan No. 30 - St Marys, Waterside, Thornton, the WELL Precinct, Glenmore Park and Erskine Park). See <http://www.penrithcity.nsw.gov.au/uploadedFiles/Content/Website/Our_Services/Planning_and_Development/Planning__Zoning_Information/Local_Planning_Documents/LocalOpenSpaceDCP(1).pdf>

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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The Penrith City District Open Space Facilities Development Contributions Plan applies anywhere residential development is permitted within the City of Penrith, with the exclusion of industrial lands and the Penrith Lakes development site.

The Penrith City Centre Civic Improvement Plan applies to the land.

9A BIODIVERSITY CERTIFIED LAND

(Information is provided in this section only if the land is biodiversity certified land (within the meaning of Part 7AA of the *Threatened Species Conservation Act 1995*).)

10 BIOBANKING AGREEMENTS

(Information is provided in this section only if Council has been notified by the Director-General of the Department of Environment, Climate Change and Water that the land is land to which a biobanking agreement under Part 7A of the *Threatened Species Conservation Act 1995* relates.)

11 BUSH FIRE PRONE LAND

The land is not identified as bush fire prone land according to Council records.

12 PROPERTY VEGETATION PLANS

(Information is provided in this section only if Council has been notified that the land is land to which a property vegetation plan under the Native Vegetation Act 2003 applies.)

13 ORDERS UNDER TREES (DISPUTES BETWEEN NEIGHBOURS) ACT 2006

(Information is provided in this section only if Council has been notified that an order has been made under the Trees (Disputes Between Neighbours) Act 2006 to carry out work in relation to a tree on the land.)

14 DIRECTIONS UNDER PART 3A

(Information is provided in this section only if there is a direction by the Minister in force under section 75P(2)(c1) of the Act that a provision of an environmental planning instrument prohibiting or restricting the carrying out of a project or a stage of a project on the land under Part 4 of the Act does not have effect.)

15 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS AFFECTING SENIORS HOUSING

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(a) there is a current site compatibility certificate (seniors housing), of which the council is aware, issued under State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 18(2) of State Environmental Planning Policy (Housing for Seniors or People with a Disability) 2004 have been imposed as a condition of consent to a development application granted after 11 October 2007 in respect of the land.)

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Version: 1, Version Date: 14/04/2021

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PLANNING CERTIFICATE UNDER SECTION 149

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16 SITE COMPATIBILITY CERTIFICATES FOR INFRASTRUCTURE

(Information is provided in this section only if there is a valid site compatibility certificate (infrastructure), of which council is aware, in respect of proposed development on the land.)

17 SITE COMPATIBILITY CERTIFICATES AND CONDITIONS FOR AFFORDABLE RENTAL HOUSING

(Information is provided in this section only if:

(a) there is a current site compatibility certificate (affordable rental housing), of which the council is aware, in respect of proposed development on the land; and/or

(b) any terms of a kind referred to in clause 17(1) or 37(1) of State Environmental Planning Policy (Affordable Rental Housing) 2009 have been imposed as a condition of consent to a development application in respect of the land.)

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(Information is provided in this section only if there is a current site verification certificate, of which council is aware, in respect of the land.)

NOTE: The following matters are prescribed by section 59(2) of the Contaminated Land Management Act 1997 as additional matters to be specified in a planning certificate

(a) (Information is provided in this section only if, as at the date of this certificate, the land (or part of the land) is significantly contaminated land within the meaning of the Contaminated Land Management Act 1997.)

(b) (Information is provided in this section only if, as at the date of this certificate, the land is subject to a management order within the meaning of the Contaminated Land Management Act 1997.)

(c) (Information is provided in this section only if, as at the date of this certificate, the land is the subject of an approved voluntary management proposal within the meaning of the Contaminated Land Management Act 1997.)

(d) (Information is provided in this section only if, at the date of this certificate, the land subject to an ongoing maintenance order within the meaning of the Contaminated Land Management Act 1997.)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PENRITH CITY COUNCIL

Civic Centre
601 High Street, Penrith

PO Box 60 Penrith NSW 2751

Telephone: 02 4732 7777
Facsimile: 02 4732 7958

Email: pencit@penrithcity.nsw.gov.au

(e) (Information is provided in this section only if the land is the subject of a site audit statement within the meaning of the Contaminated Land Management Act 1997 – a copy of which has been provided to Council.)

Note: Section 149(5) information for this property may contain additional information regarding contamination issues.

Note: The Environmental Planning and Assessment Amendment Act 1997 commenced operation on the 1 July 1998. As a consequence of this Act the information contained in this certificate needs to be read in conjunction with the provisions of the Environmental Planning and Assessment (Amendment) Regulation 1998, Environmental Planning and Assessment (Further Amendment) Regulation 1998 and Environmental Planning and Assessment (Savings and Transitional) Regulation 1998 and Environmental Planning and Assessment Regulation 2000.

Information is provided only to the extent that Council has been notified by relevant government departments.

149(5) Certificate
This Certificate is directed to the following relevant matters affecting the land

When information pursuant to section 149(5) is requested the Council is under no obligation to furnish any of the information supplied herein pursuant to that section. Council draws your attention to section 149(6) which states that a council shall not incur any liability in respect of any advice provided in good faith pursuant to sub-section (5). The absence of any reference to any matter affecting the land shall not imply that the land is not affected by any matter not referred to in this certificate.

Note:

- Council's 149(5) information does not include development consent or easement information. Details of development consents may be obtained by making enquiries with Council's Development Services Department pursuant to section 12 of the Local Government Act 1993 or (for development applications lodged after January 2007) by viewing the Online Services area at www.penrithcity.nsw.gov.au . Details of any easements may be obtained from a Title Search at Land and Property Information New South Wales.
- This certificate does not contain information relating to Complying Development Certificates.
- This certificate may not provide full details of development rights over the land.

* Threatened Species Conservation Act 1995

When considering any development application Council must have regard to the Threatened Species Conservation Act 1995. Please note that this legislation may have application to any land throughout the city. Interested persons should make their own enquiries in regard to the impact that this legislation could have on this land.

* Preservation of Trees and Vegetation

See Clauses 5.9 and 5.9AA of Penrith Local Environmental Plan 2010 and Chapter C2 of Penrith Development Control Plan 2014 for specific controls relating to the preservation of trees and vegetation.

* Development Control Plan General Information

Penrith Development Control Plan 2014 which applies to the land, sets out requirements for a range of issues that apply across the Penrith Local Government Area, including:

- Site Planning and Design Principles

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Vegetation Management
- Water Management
- Land Management
- Waste Management
- Landscape Design
- Culture and Heritage
- Public Domain
- Advertising and Signage
- Transport, Access and Parking
- Subdivision
- Noise and Vibration, and
- Infrastructure and Services.

The Development Control Plan also specifies requirements relating to various types of land uses including:

- Rural Land Uses
- Residential Development
- Commercial and Retail Development, and
- Industrial Development

as well as for a number of specific activities, including child care centres; health consulting rooms; educational establishments; parent friendly amenities; places of public worship; vehicle repair stations; cemeteries, crematoria and funeral homes; extractive industries; and telecommunication facilities.
The Development Control Plan also details requirements relating to key precincts within the Penrith Local Government Area, including:

- Caddens
- Claremont Meadows Stage 2
- Cranebrook
- Emu Heights
- Emu Plains
- Erskine Business Park
- Glenmore Park
- Kingswood
- Mulgoa Valley
- Orchard Hills
- Penrith
- Penrith Health and Education Precinct
- Riverlink Precinct
- St Clair, and
- St Marys / St Marys North.

Penrith Development Control Plan 2014 may be accessed at https://www.penrithcity.nsw.gov.au/Building-and-Development/Planning-and-Zoning/Planning-Controls/Development-Control-Plans/

* Penrith City Centre Controls

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PENRITH CITY COUNCIL

Civic Centre
601 High Street, Penrith

PO Box 60 Penrith NSW 2751

Telephone: 02 4732 7777
Facsimile: 02 4732 7958

Email: pencit@penrithcity.nsw.gov.au

PLANNING CERTIFICATE UNDER SECTION 149

Environmental Planning and Assessment Act, 1979

See Part 8 of Penrith Local Environmental Plan 2010 and Chapter E11 of Penrith Development Control Plan 2014 for specific controls relating to Penrith City Centre (which includes the subject property).

* Active Street Frontage

The land is identified as an "Active Street Frontage" on the Penrith Local Environmental Plan 2010 (PLEP 2010) Active Street Frontages Map. See Clause 7.8 of PLEP 2010 for details.

Alan Stoneham
General Manager

PER

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix G Australian and NSW Heritage Data Base Searches

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Search Results

9 results found.

Blacktown Native Institution Site Richmond Rd	Oakhurst, NSW, Australia	(Nominated place) National Heritage List
Combewood, Outbuildings and Garden 306 RMB Castlereagh Rd	Penrith, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Museum of Fire Castlereagh Rd	Penrith, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Penrith Courthouse (former) High St	Penrith, NSW, Australia	(Destroyed) Register of the National Estate (Non-statutory archive)
St Stephens Anglican Church & Graveyard 252 High St	Penrith, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Thornton Hall & Surrounds 11 Mountain View Cr	Penrith, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Thornton Hall & Surrounds 11 Mountain View Cr	Penrith, NSW, Australia	(Place removed from CHL) Commonwealth Heritage List
Thornton Hall and Surrounds (former Defence land) 11 Mountain View Cr	Penrith, NSW, Australia	(Place removed from CHL) Commonwealth Heritage List
Victoria Bridge Great Western Hwy	Penrith, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Report Produced: Tue Nov 8 09:36:57 2016

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Search for NSW heritage

Return to search page where you can refine/broaden your search.

Statutory listed items

Information and items listed in the State Heritage Inventory come from a number of sources. This means that there may be several entries for the same heritage item in the database. For clarity, the search results have been divided into three sections.

- **Section 1** - contains Aboriginal Places declared by the **Minister for the Environment** under the National Parks and Wildlife Act. This information is provided by the Heritage Division.
- **Section 2** - contains heritage items listed by the **Heritage Council of NSW** under the NSW Heritage Act. This includes listing on the State Heritage Register, an Interim Heritage Order or protected under section 136 of the NSW Heritage Act. This information is provided by the Heritage Division.
- **Section 3** - contains items listed by **local councils** on Local Environmental Plans under the Environmental Planning and Assessment Act, 1979 and **State government agencies** under s.170 of the Heritage Act. This information is provided by local councils and State government agencies.

Section 1. Aboriginal Places listed under the National Parks and Wildlife Act.

Your search did not return any matching results.

Section 2. Items listed under the NSW Heritage Act.

Your search returned 14 records.

Item name	Address	Suburb	LGA	SHR
Ahrens Fox PS2 Fire Engine (1929)	1 Museum Drive	Penrith	Penrith	01717
Craithes House	34-40 Borec Road	Penrith	Penrith	00378
Dennis Big 6 Fire Engine (1939)	1 Museum Drive	Penrith	Penrith	01718
Edward Smith Headquarters Switchboard (1909)	1 Museum Drive	Penrith	Penrith	01901
Emu Plains (Nepean River) Underbridge	Off Bruce Neale Dr, Steel Trusses 1.3 Km Past Station	Penrith	Penrith	01830
Fire and Rescue NSW Heritage Fleet	Museum Drive	Penrith	Penrith	01902
Ford 21W Fire Brigade Mobile Canteen (1942)	Museum Drive	Penrith	Penrith	01900
NSW Fire Brigades No 10 Vehicle Number Plates	Castlereagh Road	Penrith	Penrith	01519
Penrith Railway Station group	Great Western Railway	Penrith	Penrith	01222
Shand Mason 7 inch Manual Fire Engine (1869)	1 Museum Drive	Penrith	Penrith	01898

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Shand Mason Curricle Ladders (1898)	1 Museum Drive	Penrith	Penrith	01899
Shand Mason Fire Engine (1891)	Museum Drive	Penrith	Penrith	01716
Torin Building	26 Coombes Drive	Penrith	Penrith	01796
Victoria Bridge	Nepean River, Great Western Highway	Penrith	Penrith	01950

Section 3. Items listed by Local Government and State Agencies.

Your search returned 67 records.

Item name	Address	Suburb	LGA	Information source
1841 Tilley 5 inch Manual Fire Engine	1 Museum Drive	Penrith	Penrith	SGOV
1869 Shand Mason 7" Manual Fire Engine	1 Museum Drive	Penrith	Penrith	SGOV
1891 Shand Mason Steamer Fire Engine	1 Museum Drive	Penrith	Penrith	SGOV
1898 Shand Mason Curricle Ladders - Fire Engine	1 Museum Drive	Penrith	Penrith	SGOV
1916 Garford Type 64 Chain Drive Fire Engine	1 Museum Drive	Penrith	Penrith	SGOV
1929 Ahrens Fox PS2 Fire Engine	1 Museum Drive	Penrith	Penrith	SGOV
1939 Dennis Big 6 Fire Engine	1 Museum Drive	Penrith	Penrith	SGOV
1942 Ford 21W Fire Brigade Mobile Canteen	1 Museum Drive	Penrith	Penrith	SGOV
1949 Dennis F1 Fire Engine (Scout Car)	1 Museum Drive	Penrith	Penrith	SGOV
Avenue and Garden Planting	Lemko Place	Penrith	Penrith	LGOV
Broadville Victorian House	98 Station Street	Penrith	Penrith	LGOV
Combewood House, garden and original entrance	Coreen Avenue	Penrith	Penrith	LGOV
Combewood Trees	Coreen Avenue	Penrith	Penrith	LGOV
Commissioner's Uniform (NSWFire Brigades) - Ian Mac Dougall	1 Museum Drive	Penrith	Penrith	SGOV
Craithes House	Borec Road	Penrith	Penrith	LGOV
Cram Place - Cast Iron Fence	338-340 High Street	Penrith	Penrith	LGOV

Cram Place - Well and Pump	338-340 High Street	Penrith	Penrith	LGOV
Cram Place (Former CBC Bank)	338-340 High Street	Penrith	Penrith	LGOV
Cram Place (Former Coach House)	338-340 High Street	Penrith	Penrith	LGOV
Derby Street P33b Conservation Area Cottages	Castlereagh Street	Penrith	Penrith	LGOV
Derby Street P33c Conservation Area Cottages	Derby Street	Penrith	Penrith	LGOV
Dunheved Fire Station	50 Christie Street	Penrith	Penrith	SGOV
Edward Smith Headquarters Switchboard - 1909	1 Museum Drive	Penrith	Penrith	SGOV
Edwardian Cottage	323 Castlereagh Road	Penrith	Penrith	LGOV
Emu Plains (Nepean River) Underbridge	Off Bruce Neale Dr, Steel Trusses 1.3 Km Past Station	Penrith	Penrith	SGOV
Explorers Memorial	Memorial Avenue	Penrith	Penrith	LGOV
Governor Phillip Special Hospital Original Building	Glebe Place	Penrith	Penrith	LGOV
Kentucky	146 Station Street	Penrith	Penrith	LGOV
Memorial Park	Woodriff Street	Penrith	Penrith	LGOV
Methodist Church (Former)	Henry Street	Penrith	Penrith	LGOV
Museum of Fire Penrith (Former Penrith Power Station)	Castlereagh Road	Penrith	Penrith	LGOV
Nepean River		Penrith	Penrith	LGOV
NSW Fire Brigades Heritage Fleet	1 Museum Drive	Penrith	Penrith	SGOV
NSWFB 'No. 10' Vehicle Number Plates	1 Museum Drive	Penrith	Penrith	SGOV
Original building	Glebe Place	Penrith	Penrith	SGOV
Peach Tree Creek Bridge	Great Western Highway	Penrith	Penrith	SGOV
Penrith Ambulance Station	High Street	Penrith	Penrith	LGOV
Penrith Council Chambers	Henry Street	Penrith	Penrith	LGOV
Penrith Infants Department	Henry Street	Penrith	Pen	LGOV

			rith	
Penrith Public School Building	High Street	Penrith	Penrith	LGOV
Penrith Public School Palm Trees	High Street	Penrith	Penrith	LGOV
Penrith Railway Station	Jane Street	Penrith	Penrith	LGOV
Penrith Railway Station Group and Residence	Station Street	Penrith	Penrith	SGOV
Penrith Weir	Nepean River	Penrith	Penrith	SGOV
Rectory (Former)	95 Glebe Place	Penrith	Penrith	LGOV
St Aubin's Terrace	255-265 High Street	Penrith	Penrith	LGOV
St. Stehens Cemetery	252 High Street	Penrith	Penrith	LGOV
St. Stephens Church Hall	252 High Street	Penrith	Penrith	LGOV
St. Stephens Church of England	252 High Street	Penrith	Penrith	LGOV
Station Masters House (Former)	57 Belmore Street	Penrith	Penrith	LGOV
The Cottage	39 Warwick Street	Penrith	Penrith	LGOV
The Lodge	54 Camden Road	Penrith	Penrith	LGOV
Thornton Hall	Mountain View Crescent	Penrith	Penrith	LGOV
Timber Cottage	71 Parker Street	Penrith	Penrith	LGOV
Tree - The Cottage	39 Warwick Street	Penrith	Penrith	LGOV
Tree to Victorian House	48 Warwick Street	Penrith	Penrith	LGOV
Two Storey Brick Cottage (Destroyed)	7 Lawson Street	Penrith	Penrith	LGOV
Victoria Bridge	Great Western Highway	Penrith	Penrith	LGOV
Victoria Bridge	Great Western Highway	Penrith	Penrith	GAZ
Victoria Bridge over Nepean River	Great Western Highway	Penrith	Penrith	SGOV
Victorian House	48 Warwick Street	Penrith	Penrith	LGOV

Victorian House	6 Rawson Avenue	Penrith	Penrith	LGOV
Victorian House	148 Station Street	Penrith	Penrith	LGOV
Victorian House	322 Castlereagh Road	Penrith	Penrith	LGOV
Victorian Terrace	219-221 High Street	Penrith	Penrith	LGOV
Victorian Villa	150 Lethbridge Street	Penrith	Penrith	LGOV
Weir and Former Pumping Station	Memorial Avenue	Penrith	Penrith	LGOV

There was a total of 81 records matching your search criteria.

Key:
LGA = Local Government Area
GAZ= NSW Government Gazette (statutory listings prior to 1997), HGA = Heritage Grant Application, HS = Heritage Study, LGOV = Local Government, SGOV = State Government Agency.
Note: While the Heritage Division seeks to keep the Inventory up to date, it is reliant on State agencies and local councils to provide their data. Always check with the relevant State agency or local council for the most up-to-date information.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix H SafeWork NSW Records

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

SafeWork NSW
92-100 Donnison Street, Gosford, NSW, 2250
Locked Bag 2906, Lisarow, NSW, 2252 |
Customer Service Centre 13 10 50
licensing@safework.nsw.gov.au | www.safework.nsw.gov.au

Our Ref: D16707982
Your Ref: Kiu Yeung

23 November 2016

Attention: Kiu Yeung
Level 1, 50
Margaret Street
SYDNEY NSW 2000

Dear Mr Yeung

RE SITE: 114-146 Henry Street and Allen Place, Penrith NSW 2750

I refer to your site search request received by SafeWork NSW on 10 November 2016 requesting information on Storage of Hazardous Chemicals for the above site.

Enclosed are copies of the documents that SafeWork NSW holds on record number 35/010880 relating to the storage of Hazardous Chemicals at the above-mentioned premises.

For further information or if you have any questions, please call our Customer Service Centre on 13 10 50 or email licensing@safework.nsw.gov.au

Yours sincerely,

Sally Anderson obo Brent Jones
Customer Service Officer
Customer Service Centre - Operations
SafeWork NSW

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

INSPECTION RECORD

Licence No. 10880

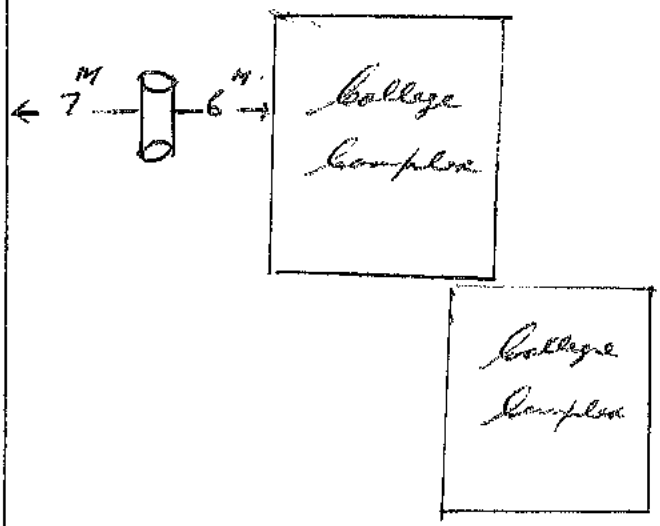
Licensee: Education Dept
Penrith Tech. College

Address: Henry St. Penrith

Storage licensed: 1 x 2.22 K.L. Tank

Sketch of Premises (Dimensions of depot and distance of same from adjoining "protected works" to be shown).

Henry St



Cav. Park

High St

Inspected	Initials	Requisitions made or state of depot
25.7.77.	M Lowry	Satisfactory

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

RTMENT OF LABOUR AND INL

INFLAMMABLE LIQUID ACT, 1915

LICENCE No. 10880

-5 MAR 1976

APPLICATION FOR: REGISTRATION OF PREMISES / STORE LICENCE / AMENDMENT TO REGISTRATION OR LICENCE } FOR THE KEEPING OF INFLAMMABLE LIQUID AND/OR DANGEROUS GOODS. 8

Name of Occupier: EDUCATION DEPT.
(Surname) (First Names)

Trading Name (if any): PENRITH TECH. COLLEGE

Postal Address: HENRY ST. PENRITH Postcode 2750

Address of the premises in which the depot or depots are situated: AS ABOVE Postcode

Occupation:

Nature of Premises: SCHOOL BUILDINGS

Particulars of construction of depots and maximum quantities of inflammable liquid and/or dangerous goods to be kept at any one time.

PLEASE SKETCH SITE ON BACK OR ATTACH PLAN

Depot No.	Construction of depots *			Inflammable Liquid		Dangerous Goods						
	Walls	Roof	Floor	Mineral spirit litres	Mineral oil litres	Class 1 litres	Class 2 litres	Class 3 kg	Class 4 m^3	Class 5A# litres	Class 5B# litres	Class 9 litres
1	ABOVE	GROUND	TANK							2-22HL		
2												
3												
4												
5												
6												
7												
8												
9												
10												
		TOTAL										

PUBLIC REVENUE A/c
19.3.76 $1.00 Fee

* If kept in tanks describe depots as underground or aboveground tanks.

(Date)

Insert water capacity of tanks or cylinders.

Receipt No. 5204

Name of Company supplying inflammable liquid: GAS SUPPLY CO.

Have premises previously been licensed? NO

If known, state name of previous occupier:

Signature of applicant: dot Chairman Light, Heat & Power Committee per [signature] Date 2.3.76

CERTIFICATE OF INSPECTION

I, [illegible] being an Inspector under th Inflammable Liquid Act, 1915, do hereby certify that the premises or store described above does comply with th requirements of that Act and regulations with regard to its situation and construction for the keeping of inflammabl liquid and/or dangerous goods in quantity and nature specified.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Form DGI

DEPARTMENT OF INDUSTRIAL RELATIONS

LICENCE No. 35010880.7
P/A

DANGEROUS GOODS ACT, 1975

APPLICATION FOR LICENCE (or AMENDMENT or TRANSFER of LICENCE) FOR THE KEEPING OF DANGEROUS GOODS

Application is hereby made for— *a licence (or amendment of the licence) *the transfer of the licence for the keeping of dangerous goods in or on the premises described below.

(*delete whichever is not required)

FEE: $10.00 per Depot for new licence.
$10.00 for amendment or transfer.

Name of Applicant in full (see over)	DEPT. OF PUBLIC WORKS
Trading name or occupier's name (if any)	LIGHT HEAT & POWER COMMITEE
Postal address	STATE OFFICE BLOCK PHILLIP ST SYDNEY Postcode 2000
Address of the premises including street number (if any)	PENRITH TECHNICAL COLLEGE 281 HENRY ST, PENRITH Postcode 2750
Nature of premises (see over)	SCHOOL
Telephone number of applicant	STD Code 047 Number 31-5044

Particulars of type of depots and maximum quantities of dangerous goods to be kept at any one time.

Depot number	Type of depot (see over)	Storage capacity	Dangerous goods: Product being stored	C & C Office use only
1	ABOVEGROUND TANK	2200 L	PROPANE	
2	CYLINDER STORE	70 m^3	ACETYLENE	
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				

Has site plan been approved? Yes ~~No~~ If yes, no plans required. If ~~no, please attach site plan~~.

Have premises previously been licensed? Yes ~~No~~ If yes, state name of previous occupier.

Name of company supplying flammable liquid (if any) C.I.G.

Signature of applicant X ..... Date 18/6/81

For external explosives magazine(s), please fill in side 2.

FOR OFFICE USE ONLY

CERTIFICATE OF INSPECTION

I RAYMOND CHARLES MCGRATH being an Inspector under the Dangerous Goods Act, 1975, do hereby certify that the premises described above do comply with the requirements of the Dangerous Goods Act, 1975, and the

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PART C – Dangerous Goods Storage *Complete one section per depot.*

If you have more depots than the space provided, photocopy sufficient sheets first.

Depot Number	Type of depot	Depot Class	Maximum storage capacity
1.	8 x 45 kg. Cylinders. (CYLINDER STORE)	2.1	360 Kg.

UN Number	Correct Shipping Name	Class	PG (I, II, III)	Product or common name	Typical quantity	Unit, e.g. L, kg, m³
1075.	Petroleum Gases, Liquified.	2.1	-	L.P. GAS	360	kg.

Depot Number	Type of depot	Depot Class	Maximum storage capacity
2	1 x 2.5 KL. VAPOUR TANK (ABOVE GROUND TANK)	2.1	2.5 KL.

UN Number	Correct Shipping Name	Class	PG (I, II, III)	Product or common name	Typical quantity	Unit, e.g. L, kg, m³
1075	Petroleum Gases, Liquified	2.1	-	L.P. GAS	2.5	KL.

Depot Number	Type of depot	Depot Class	Maximum storage capacity

UN Number	Correct Shipping Name	Class	PG (I, II, III)	Product or common name	Typical quantity	Unit, e.g. L, kg, m³

Depot Number	Type of depot	Depot Class	Maximum storage capacity

UN Number	Correct Shipping Name	Class	PG (I, II, III)	Product or common name	Typical quantity	Unit, e.g. L, kg, m³

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Application for Licence to Keep Dangerous Goods

WorkCover NEW SOUTH WALES

Application for ☐ new licence ☐ amendment ☐ transfer ☑ renewal of expired licence

PART A – Applicant and site information

1 Name of applicant: WESTERN SYDNEY INSTITUTE OF TAFE, PENRITH COLLEGE. DENNIS BURKE, College Director.

ACN:

2 Postal address of applicant: 117 HENRY ST.,

Suburb/Town: PENRITH

Postcode: 2750.

3 Trading name or site occupier's name: PENRITH COLLEGE OF T.A.F.E.

4 Contact for licence inquiries

Phone: 02.830.1219

Fax: 02.830.1299

Name: John BUCKMAN.

RECEIVED
-8 FEB 1996
SCIENTIFIC BRANCH

5 Previous licence number (if known): 35/ 010880.7

6 Previous occupier (if known): -

7 Site to be licensed

No: 117

Street: HENRY STREET

Suburb / Town: PENRITH

Postcode: 2750

8 Main business of site: Technical & Further Education.

DATA
24 FEB 1996
ENTERED

9 Site staffing: Hours per day: 13 Days per week: 5

10 Emergency contact

Phone: 02.534.6850 (H) 047.24.1713 (B)

Name: Dennis BURKE.

11 Major supplier of dangerous goods: ELGAS.

12 If a new site or for amendments to depots

Plan stamped by: Name of Accredited Consultant: Donald ALLEN (ELGAS).

Date stamped: 31.1.96.

I certify that the details in this application (including any accompanying computer disk) are correct and cover all licensable quantities of dangerous goods kept on the premises.

13 Signature of applicant: John Buckman for Dennis Burke, College Director.

Date: 31st. Jan., 1996.

Please send your application, marked *CONFIDENTIAL*, to:

Dangerous Goods Licensing, Level 3, Locked Bag 10, Clarence Street, SYDNEY NSW 2000

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

WorkCover New South Wales, 400 Kent Street. Sydney 2000. Tel: (02) 9370 5000 ALL MAIL TO LOCKED BAG 10. CLARENCE STREET, SYDNEY 2000

DX 13067, MARKET ST. SYDNEY

WORKCOVER NEW SOUTH WALES

Reference

APPLICATION FOR RENEWAL

OF LICENCE TO KEEP DANGEROUS GOODS

ISSUED UNDER AND SUBJECT TO THE PROVISIONS OF THE DANGEROUS GOODS ACT, 1975 AND REGULATION THEREUNDER

DECLARATION: *Please renew licence number 35/010880 to 1999. I confirm that all the licence details shown below are correct (amend if necessary).*

R Kiddle ..... ROBERT KIDDLE 14/1/98

(Signature) *(Please print name)* *(Date signed)*

for: TECHNICAL & FURTHER EDUCATION COMMISSION

*THIS **SIGNED** DECLARATION SHOULD BE **RETURNED TO:***

WorkCover New South Wales
Dangerous Goods Licensing Section (Level 3)
Locked Bag 10
P O CLARENCE STREET 2000

Enquiries: ph (02) 9370 5187
fax (02) 9370 6105

DATA ENTERED 27 JAN 1998

Details of licence on 5 January 1998

Licence Number 35/010880 **Expiry Date** 08/02/98

Licensee TECHNICAL & FURTHER EDUCATION COMMISSION
WESTERN SYDNEY INSTITUTE OF TAFE

Postal Address 117 HENRY ST, PENRITH 2750

Licensee Contact ~~John Buckman~~ BOB KIDDLE Ph. 9830 1219 Fax. 9830 ~~1299~~ 1557

Premises Licensed to Keep Dangerous Goods
117 HENRY ST Penrith College
PENRITH 2750

Nature of Site Technical & Further Education **Major Supplier of Dangerous Goods** ELGAS

Emergency Contact for this Site ~~Dennis Burke (ah 02 5346850)~~ ph. ~~047 24 1713~~
JOHN CLARK 018472574
or KEVIN DOWSE 047365526

Site staffing 13hrs 5days

Details of Depots

Depot No.	Depot Type	Goods Stored in Depot	Qty
1	CYLINDER STORE	Class 2.1	360 kg
		UN 1075 PETROLEUM GASES, LIQUE	360 kg
2	ABOVE-GROUND TANK	Class 2.1	2500 L
		UN 1075 PETROLEUM GASES, LIQUE	2125 L

RECEIVED 18 FEB 1998 SCIENTIFIC SERVICES

Form DG10

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

DEPOT 1

DEPOT 2

This is to certify that this drawing complies with current NSW regulations

DRAWING NUMBER CPP3-5

REGISTER NUMBER 96-076B

INSTALLATION DETAILS Depot 1 8x4.5m/18 cyl.

Depot 2 = 1 x 2.5HL upper tank

CONTRACTORS AUTHORITY

DATE 31/1/96

SIGNED

ELGAS

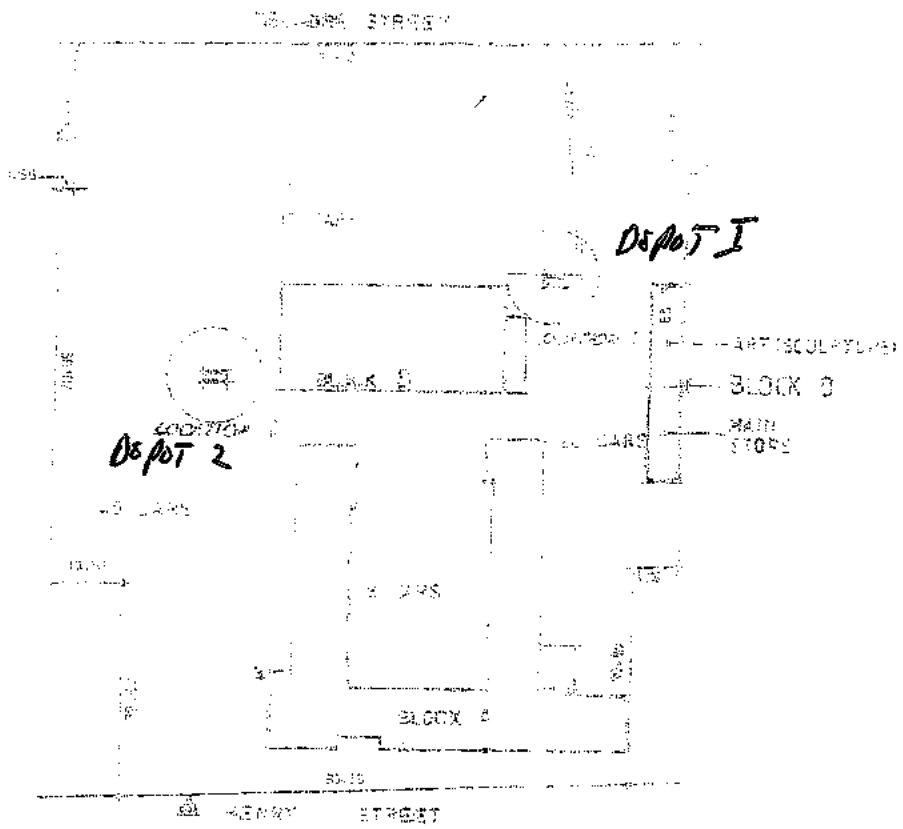
This plan conforms with the Dangerous Goods Act NSW 1975 and Austr Standard AS 1596 signed for Elgas Limited.

Date 31-1-96

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

35/010880

This is to certify that this drawing complies with current NSW regulations	
DRAWING NUMBER CPP-3	REGISTER NUMBER 96-076 A
INSTALLATION DETAILS DEPOT 1 - 8 X 45 KG cyls DEPOT 2 = 1 X 3.5 tnL VAPOUR TANK	
CONTRACTORS AUTHORITY NO. A2243	ELGAS
DATE 31/1/96	
SIGNED	



This plan conforms with the Dangerous Goods Act NSW 1975 and Austr Standard AS 1596 signed for Elgas Limited.

.....Date 31-1-96

	DRAWN DM	NORTH COLLEGE	CPP-3
DATE	TRACED DM	SITE PLAN LAC STORAGE LOCATIONS.	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PENRITH CAMPUS

A block

Room	Floor	Area	
A-G-13	Ground	5	Conference
A-G-17	Ground	6	Audio
A-G-19	Ground	7	Lecture
A-G-20	Ground	7	Lecture
A-G-51	Ground	4	Lecture
A-G-52	Ground	4	Lecture
A-G-58	Ground	3	Lecture
A-G-59	Ground	3	Lecture
A-1-05	1st	3	Lecture
A-1-07	1st	3	Lecture
A-1-09	1st	3	Lecture
A-1-10	1st	4	Lecture
A-1-11	1st	5	Lecture
A-1-22	1st	5	Dining 1
A-1-23	1st	5	Dining 2
A-1-25	1st	5	Kitchen 1
A-1-28	1st	5	Kitchen 2
- A-1-33	1st	5	Lecture
- A-1-34	1st	5	Lecture

* *Access by stairwell in area 5 only.*

General - A block

Library	6	Ground
Admin. Office	4	Ground
Cashier	4	Ground
Canteen	3	Ground
Counsellor	4	Ground
Courtesy Info.	4	Ground

B block

Room	Floor	Area	
B-G-04	Ground	1	Computer
B-G-05	Ground	2	Computer
B-G-18	Ground	2	Ceramics
B-G-22	Ground	2	Computer
B-G-25	Ground	1	Computer
B-1-05	1st	1	Lecture
B-1-06	1st	1	Lecture
B-1-10	1st	2	Lecture
B-1-12	1st	2	A.B.E Centre
B-1-13	1st	2	Lecture
B-2-01	2nd	2	Computer
B-2-03	2nd	2	Reception
B-2-07	2nd	2	Lecture
B-2-08	2nd	2	Lecture
B-2-10	2nd	2	Computer
B-2-13	2nd	2	Computer
B-2-14	2nd	1	Computer
B-2-19	2nd	1	Computer

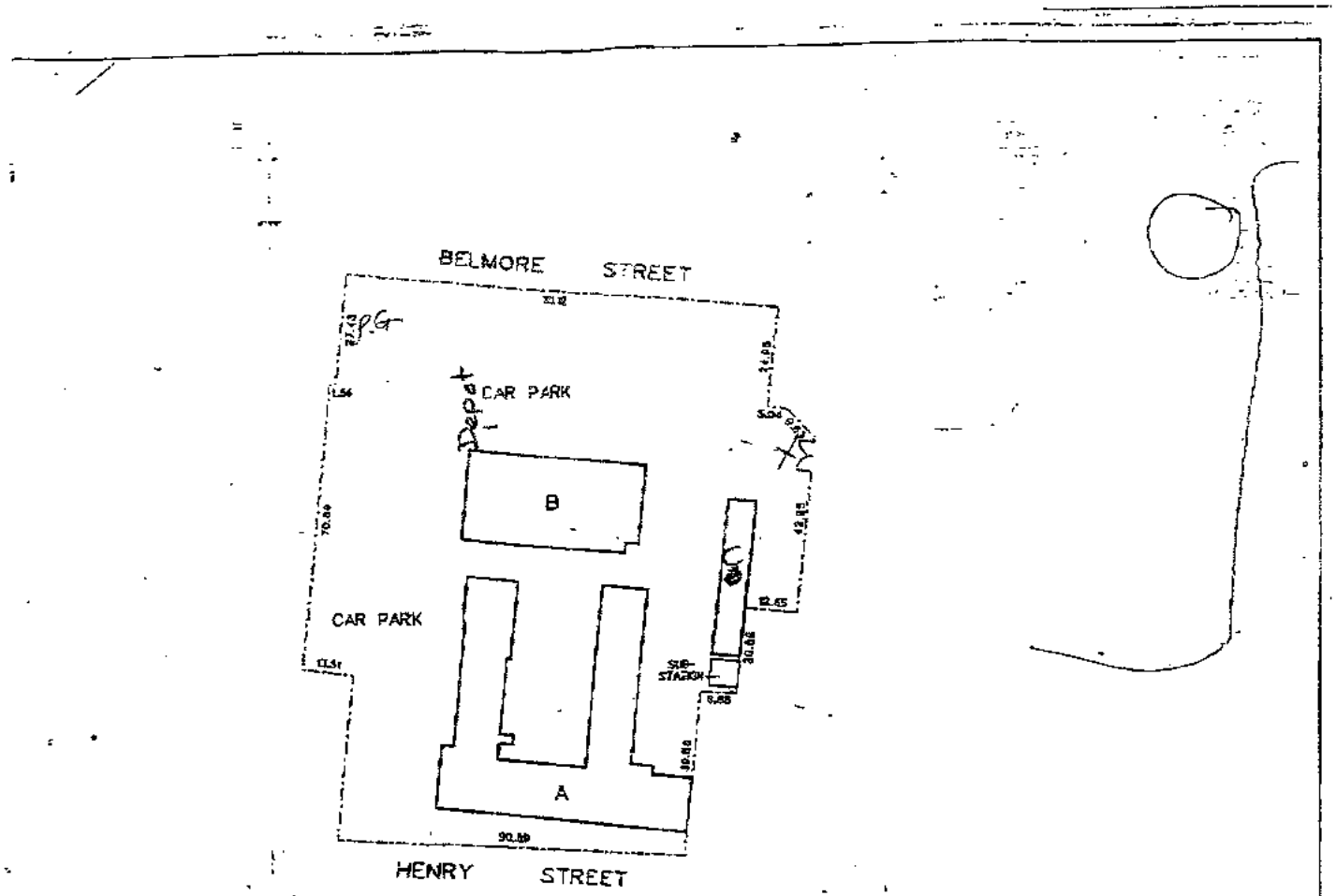
C block

Room	Floor	Area	
C-G-01	Ground	8	Ceramics

Toilets

A Block	Ground	4	Disabled
A Block	1st	5	Ladies & Men
A Block	1st	4	Ladies only
B Block	Ground	1	Ladies & Men
B Block	1st	1	Ladies only
B Block	2nd	1	Mens only

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



SCALE 1:1000 | SHEET 1 OF 7

APPROVED TO ISSUE for Lieutenant

ISSUE 1

DATE AUG 95

DR. CH.

PENRITH COLLEGE

SITE PLAN

TAFE

92089315

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

WorkCover New South Wales, 400 Kent Street. Sydney 2000. Tel: (02) 9370 5000 ALL MAIL TO LOCKED BAG 10. CLARENCE STREET, SYDNEY 2000
DX 13067, MARKET ST. SYDNEY

WORKCOVER NEW SOUTH WALES

Reference

APPLICATION FOR RENEWAL
OF LICENCE TO KEEP DANGEROUS GOODS

ISSUED UNDER AND SUBJECT TO THE PROVISIONS OF THE DANGEROUS GOODS ACT, 1975 AND REGULATION THEREUNDER

DECLARATION: *Please renew licence number 35/010880 to 1999. I confirm that all the licence details shown below are correct (amend if necessary).*

R Kiddle ROBERT KIDDLE 14/1/98

(Signature) *(Please print name)* *(Date signed)*

for: TECHNICAL & FURTHER EDUCATION COMMISSION

*THIS **SIGNED** DECLARATION SHOULD BE **RETURNED TO:***

WorkCover New South Wales
Dangerous Goods Licensing Section (Level 3)
Locked Bag 10
P O CLARENCE STREET 2000

Enquiries: ph (02) 9370 5187
fax (02) 9370 6105

DATA ENTERED 27 JAN 1998

Details of licence on 5 January 1998

Licence Number 35/010880 **Expiry Date** 08/02/98

Licensee TECHNICAL & FURTHER EDUCATION COMMISSION
WESTERN SYDNEY INSTITUTE OF TAFE

Postal Address 117 HENRY ST, PENRITH 2750

Licensee Contact ~~John Buckman~~ BOB KIDDLE Ph.~~9830 1219~~ 1557 Fax.~~9830 1299~~

Premises Licensed to Keep Dangerous Goods
117 HENRY ST Penrith College
PENRITH 2750

Nature of Site Technical & Further Education **Major Supplier of Dangerous Goods** ELGAS

Emergency Contact for this Site ~~Dennis Burke (ah 02 5346850)~~ ph. ~~047 24 1713~~
JOHN CLARK 018472574
or KEVIN DOWSE 047365526

Site staffing 13hrs 5days

Details of Depots

Depot No.	Depot Type	Goods Stored in Depot	Qty
1	CYLINDER STORE	Class 2.1	360 kg
		UN 1075 PETROLEUM GASES, LIQUE	360 kg
2	ABOVE-GROUND TANK	Class 2.1	2500 L
		UN 1075 PETROLEUM GASES, LIQUE	2125 L

RECEIVED 16 JAN 1998 SCIENTIFIC SERVICES

Form DG10

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

What is a depot? See page 5 of the Guidance Notes.

PART C – Dangerous Goods Storage *Complete one section per depot.*

If you have more depots than the space provided, photocopy sufficient sheets first.

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity
1	Above-Ground Tank	2.1	190 kg

UN Number	Proper Shipping Name	Class (I, II, III)	PG	Product or common name	Typical quantity	Unit, e.g. L, kg, m³
1075	Petroleum Gases	2.1		LPG	190	kg

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity

UN Number	Proper Shipping Name	Class (I, II, III)	PG	Product or common name	Typical quantity	Unit, e.g. L, kg, m³

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity

UN Number	Proper Shipping Name	Class (I, II, III)	PG	Product or common name	Typical quantity	Unit, e.g. L, kg, m³

Depot Number	Type of depot (see page 5)	Depot Class	Maximum storage capacity

UN Number	Proper Shipping Name	Class (I, II, III)	PG	Product or common name	Typical quantity	Unit, e.g. L, kg, m³

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Application for Licence to Keep Dangerous Goods

WorkCover NEW SOUTH WALES

Application for ☐ new licence ☑ amendment ☐ transfer ☐ renewal of expired licence

PART A – Applicant and site information See page 2 of Guidance Notes.

1 Name of applicant | ACN

Technical & Further Education Commission |

2 Postal address of applicant | Suburb/Town | Postcode

O'Connell St | Kingswood | 2747

3 Trading name or site occupier's name

Nepean College of TAFE - Penrith

4 Contact for licence inquiries

Phone | Fax | Name

9208 9315 | 9208 9286 | K Handley

5 Previous licence number (if known) 35/010880

6 Previous occupier (if known) Western Sydney Institute of TAFE-Penrith

7 Site to be licensed

No | Street

117 | Henry St

Suburb / Town | Postcode

Penrith | 2750

8 Main business of site Educational

9 Site staffing: Hours per day 15 Days per week 5

10 Site emergency contact

Phone | Name

02 4736 5526 Home | Kevin Dowse

0411 283 213 mobile

11 Major supplier of dangerous goods Kleenheat Gas

12 If a new site or for amendments to depots – see page 4 of Guidance Notes.

Plan stamped by: | Name of Accredited Consultant | Date stamped

I certify that the details in this application (including any accompanying computer disk) are correct and cover all licensable quantities of dangerous goods kept on the premises.

13 Signature of applicant | Printed name | Date

K Handley | K Handley | 11.4.00

Please send your application, marked *CONFIDENTIAL*, to: **Dangerous Goods Licensing, WorkCover NSW, Level 3, GPO Box 5364, SYDNEY NSW 2001**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

92089315

WorkCover New South Wales, 370 Kent Street, Sydney 2000. Tel: 9370 5000 Fax: 9370 5999 ALL MAIL TO G.P.O. BOX 5364 SYDNEY 2001

WORKCOVER NEW SOUTH WALES

** REMINDER NOTICE **

APPLICATION FOR RENEWAL

OF LICENCE TO KEEP DANGEROUS GOODS

ISSUED UNDER AND SUBJECT TO THE PROVISIONS OF THE DANGEROUS GOODS ACT, 1975 AND REGULATION THEREUNDER

DECLARATION: Please renew licence number 35/010880 to 2000/2001 . I confirm that all the licence details shown below are correct (amend if necessary).

K Handley (Signature) K Handley (Please print name) 11.4.99 (Date signed)

for: TECHNICAL & FURTHER EDUCATION COMMISSION

*THIS **SIGNED** DECLARATION SHOULD BE **RETURNED TO**:*

WorkCover New South Wales
Dangerous Goods Licensing Section
GPO BOX 5364
SYDNEY 2001

Enquiries: **ph (02) 9370 5187**
fax (02) 9370 6104

Details of licence on 30 March 2000

Licence Number 35/010880 **Expiry Date** 8/02/1999 **No. of Depots** 2

Licensee TECHNICAL & FURTHER EDUCATION COMMISSION
WESTERN SYDNEY INSTITUTE OF TAFE

Postal Address: WESTERN SYDNEY INSTITUTE OF TAFE 117 HENRY ST PENRITH NSW 2750

Licensee Contact ~~BOB KIDDLE~~ **Ph.** ~~9830 1219~~ Fax. ~~9830 1557~~

Premises Licensed to Keep Dangerous Goods PENRITH COLLEGE
TECHNICAL & FURTHER EDUCATION COMMISSION WESTERN SYDNEY INSTITUTE OF TAFE
117 HENRY ST PENRITH 2750

Nature of Site TECHNICAL AND FURTHER EDUCATION

Major Supplier of Dangerous Goods ELGAS

Emergency Contact for this Site ~~JOHN CLARK~~ (K DOWSE 047365526) ~~Ph. 018 472 574~~

Site staffing 13HRS 5DAYS

Details of Depots

Depot No.	Depot Type	Goods Stored in Depot	Qty
1	**CYLINDER STORE**	**Class 2.1**	**360 KG**
	UN 1075 PETROLEUM GASES, LIQUEFIED		360 KG
2	**ABOVE-GROUND TANK**	**Class 2.1**	**2500 L**
	UN 1075 PETROLEUM GASES, LIQUEFIED		2125 L

FORM DG10

DX 10067, MARKET ST SYDNEY

http://www.workcover.nsw.gov.au
Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Guidance Notes for Part B – Site sketch

Please read these notes before you draw the site sketch. For more information, please phone (02) 9370 5187 and ask for the leaflet about site sketches.

A site sketch, drawn in black on A4 size paper, is required as part of the application. This sketch will be scanned by computer so that it can be made available to emergency services in the case of an incident. The site sketch must be drawn:

- with thick lines in black ink. DO NOT USE COLOUR. Keep it simple and clear.
- on A4 size paper.
- with all lettering at least 3 mm high (THIS SIZE OR LARGER).

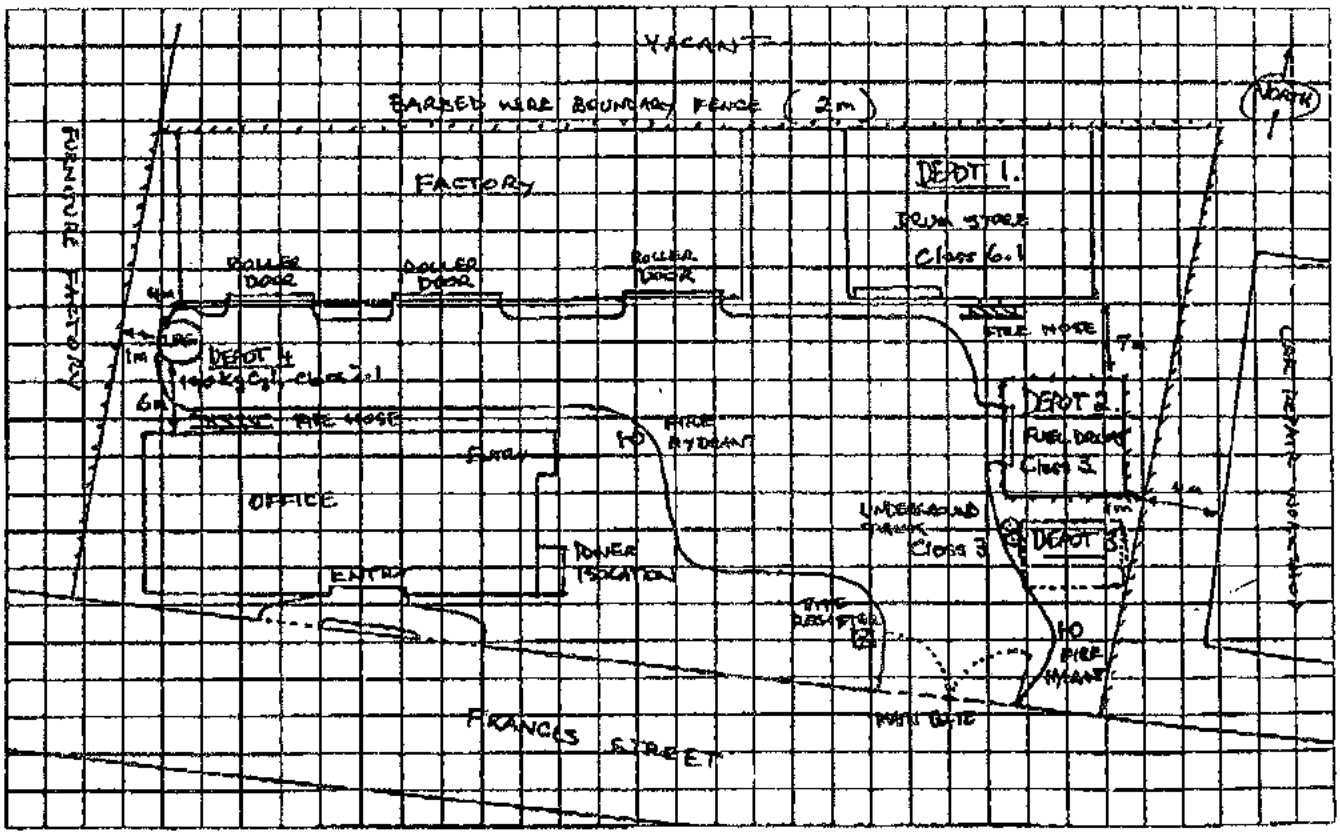
The site sketch must show the following if they exist:

1 public roads (with names)
2 internal road layout
3 site main entrance
4 other entry points
5 each dangerous goods depot, Class of goods & depot number
6 emergency equipment including hydrants, hoses, extinguishers
7 approximate location of underground tanks
8 nature of adjoining sites
9 manufacturing/ processing areas
10 location of site register (if any) and site map
11 distances between dangerous goods depots and public places
12 distances between dangerous goods depots and protected places
13 distances between dangerous goods depots
14 emergency isolation points for power, fuel, etc

and other information which could assist emergency services. For example, include the location of large stores of combustible materials, process vessels or cylinders containing dangerous goods.

If the site is too large to include all this information on one A4 sheet, please provide a key map showing the location of sub-areas and a separate A4 sheet for each sub-area.

Site sketch example (reduced in size)



Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

35/010880

WESTERN SYDNEY INSTITUTE TAFE

Workcover New South Wales
Dangerous Goods Licensing Section
GPO Box 5364
SYDNEY NSW 2001

Attention: Joanne Pasfield

4.5.00

Dear Ms Pasfield

RE: APPLICATION NO. 10880 FOR LICENCE TO KEEP DANGEROUS GOODS
PREMISES: 117 HENRY ST, PENRITH 2750

In response to your letter of 29.4.00, I wish to clarify that two cylinders have been removed from Penrith TAFE, no additional cylinders have been added. This leaves only one (1) cylinder which was originally included in the Dangerous Goods Licence.

Please advise me if I need to do anything further.

Yours faithfully

K Handley

K Handley
Team Coordinator
Class Support

Cc Gayle Cole
Julia Kirwan

DEPARTMENT OF EDUCATION
Document Set ID: 9812079
Version: 1, Version Date: 14/04/2021

WorkCover NSW 1001 Australia Sydney 2000 Tel (02) 9370 5000 Fax (02) 9370 5555 DX 1200 Sydney 2001

WorkCover NEW SOUTH WALES

** REMINDER NOTICE **

APPLICATION FOR RENEWAL

OF LICENCE TO KEEP DANGEROUS GOODS

ISSUED UNDER AND SUBJECT TO THE PROVISIONS OF THE DANGEROUS GOODS ACT, 1975 AND REGULATION THEREUNDER

DECLARATION: Please renew licence number 35/010880 to 2000/2001 . I confirm that all the licence details shown below are correct (amend if necessary).

K Handley K Handley 30/3/00

(Signature) *(Please print name)* *(Date signed)*

for: TECHNICAL & FURTHER EDUCATION COMMISSION

THIS SIGNED DECLARATION SHOULD BE RETURNED TO:

WorkCover New South Wales
Dangerous Goods Licensing Section
GPO BOX 5364
SYDNEY 2001

Enquiries: ph (02) 9370 5187
fax (02) 9370 6104

Details of licence on 30 March 2000

Licence Number 35/010880 **Expiry Date** 8/02/1999 **No. of Depots** 2

Licensee TECHNICAL & FURTHER EDUCATION COMMISSION
WESTERN SYDNEY INSTITUTE OF TAFE

Postal Address: WESTERN SYDNEY INSTITUTE OF TAFE 117 HENRY ST PENRITH NSW 2750

Licensee Contact ~~BOB KIDDLE~~ **Ph.** ~~9836 1213~~ **Fax.** ~~9836 1567~~

Premises Licensed to Keep Dangerous Goods PENRITH COLLEGE
TECHNICAL & FURTHER EDUCATION COMMISSION WESTERN SYDNEY INSTITUTE OF TAFE
117 HENRY ST PENRITH 2750

Nature of Site TECHNICAL AND FURTHER EDUCATION

Major Supplier of Dangerous Goods ELGAS

Emergency Contact for this Site ~~JOHN CLARK~~ (K DOWSE 047365526) ~~Ph. 010 472 574~~

Site staffing 13HRS 5DAYS

Details of Depots

Depot No.	Depot Type	Goods Stored in Depot	Qty
1	CYLINDER STORE	Class 2.1	360 KG
		UN 1075 PETROLEUM GASES, LIQUEFIED	360 KG
2	ABOVE-GROUND TANK	Class 2.1	2500 L
		UN 1075 PETROLEUM GASES, LIQUEFIED	2125 L

FORM DG10

DX 1200 MARKET ST SYDNEY

http://www.workcover.nsw.gov.au
Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

NEW SOUTH WALES
DEPARTMENT
OF EDUCATION
AND TRAINING

TAFE NSW

WESTERN SYDNEY
INSTITUTE

NEPEAN COLLEGE

Kingswood Campus
12-44 O'Connell Street
Kingswood NSW 2747

Penrith Campus (all enquiries)
117 Henry Street
Penrith NSW 2750

Phone 131 870
Fax (02) 4724 8288
nepean.wsi@tafensw.edu.au
wsi.tafensw.edu.au

Workcover New South Wales
Dangerous Goods Licensing Section
Locked Bag 2906
LISAROW NSW 2252

6 January 2006

Dear Sir/Madam

The attached letter was sent to me regarding our Penrith's Site Dangerous Goods Licence No. 35/010880, please note that the Kleenheat Gas Cylinder is under the Manifest Quantity of 5,000 L therefore, we do not need to renew this Licence which expires on 6.2.2006. I would appreciate it if you can confirm in writing that this is correct.

Licence No.35/030992, I have not been issued with a renewal notice, which expired on 13.11.05, but going by the letter I received above for Penrith Site, I have updated our Kingswood Site information as attached. I would appreciate it if you can confirm that we do not need to notify you of Petrol which is under the Manifest Quantity of 500 L in writing that this is correct also.

Yours faithfully

K Handley

K Handley
Team Co-ordinator Facilities/
Class Support

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix I Current & Historical Land Title Records

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

scottASHWOOD PTY.LTD
An InfoTrack Company

ABN: 42 166 543 255
Ph: 02 9099 7400
Fax: 02 9232 7141
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Summary of Owners Report

LPI **Sydney**

Address: 142 Henry Street, Penrith

Description: - Lot 10 D.P. 553665

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
1.6.1881 (1881 to 1925)	Francis Henry Woodriff (Gentleman)	Book 222 No. 132
5.8.1925 (1925 to 1935)	John Jurry Allen (Farmer)	Book 1396 No. 195
23.2.1935 (1935 to 1948)	Alfred Charles Kemp (Orchardist)	Book 1711 No. 475
14.12.1948 (1948 to 1971)	Roy William Handley (Radio and Electrical Distributor)	Book 2075 No. 355
24.5.1971 (1971 to 1977)	Peter Shaw and Associates Pty Limited	Book 3011 No. 751 Now Vol 12193 Fol 76
1.9.1977 (1977 to 1981)	A.F.Q. Pty Limited	Vol 12193 Fol 76
September 1981 (1981 to 1985)	Gwynvill Properties Pty Limited	Vol 12193 Fol 76
29.4.1985 (1985 to Date)	# Penrith City Council	Vol 12193 Fol 76 Now 10/553665

# Denotes Current Registered Proprietors

Easements: -NIL

Leases excluding building premises: -

- Numerous Leases found from 20.6.1989 to 13.3.2012 that have since expired or have been surrendered – not investigated

Yours Sincerely
James McDonnell
9 October 2016

Email: james.mcdonnell@scottashwood.com

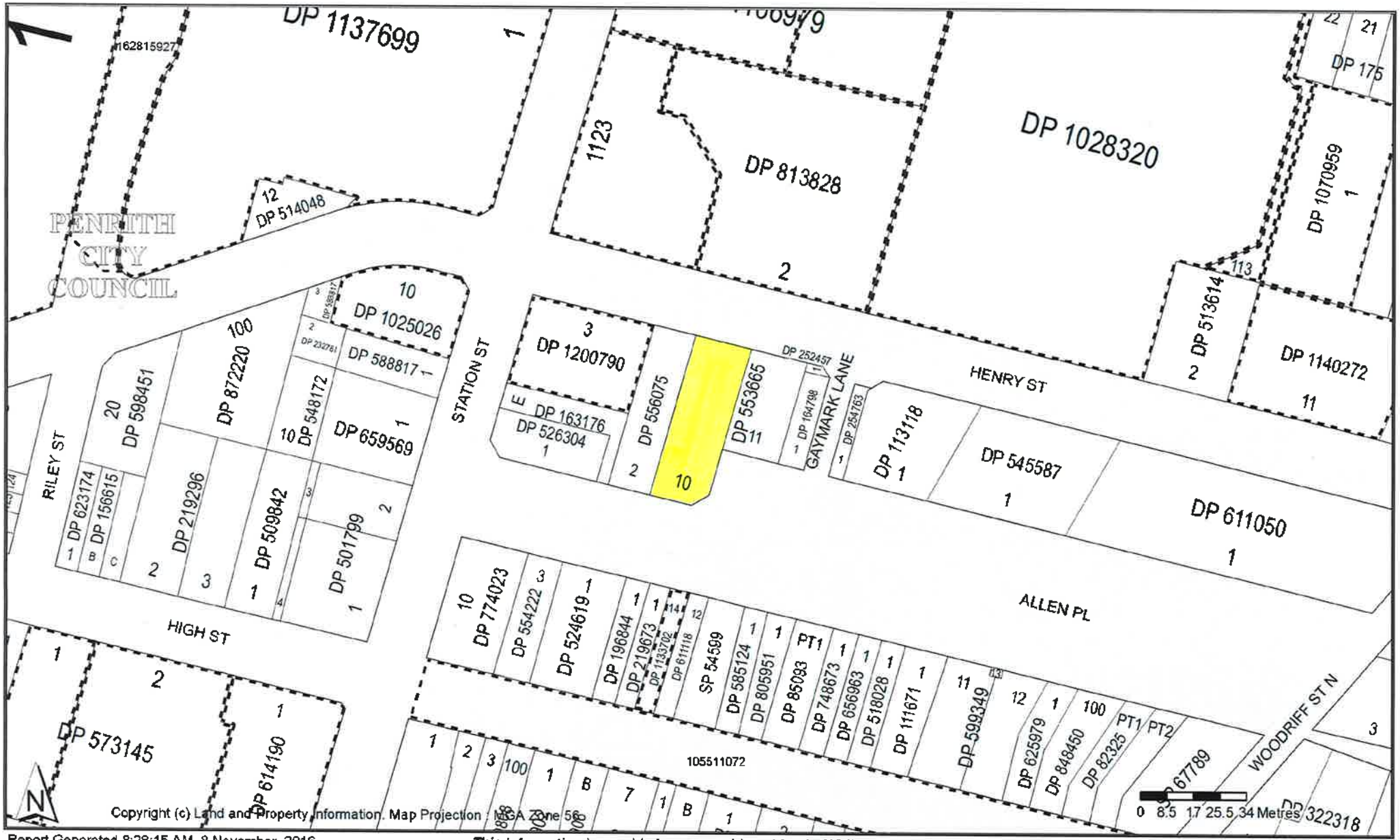
Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Land & Property Information

Cadastral Records Enquiry Report

Requested Parcel : Lot 10 DP 553665 **Identified Parcel** : Lot 10 DP 553665

Locality : PENRITH **LGA** : PENRITH **Parish** : CASTLEREAGH **County** : CUMBERLAND



Report Generated 8:28:15 AM, 8 November, 2016

Copyright © Land and Property Information ABN: 84 104 377 806

This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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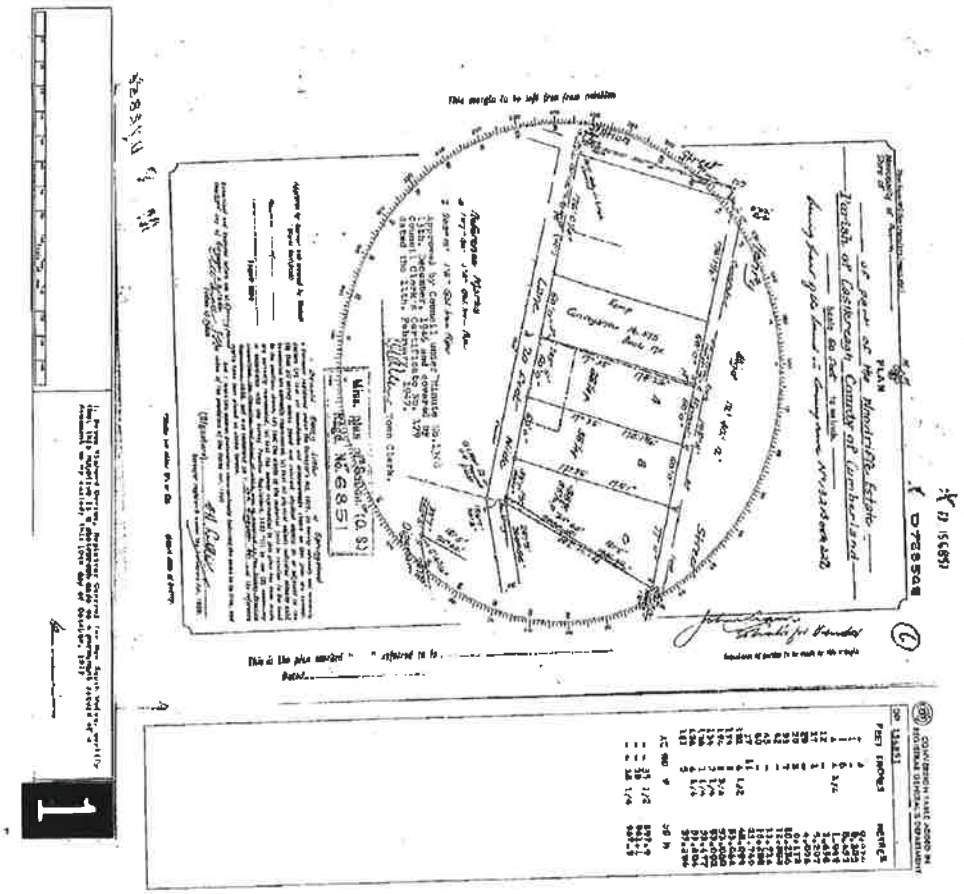

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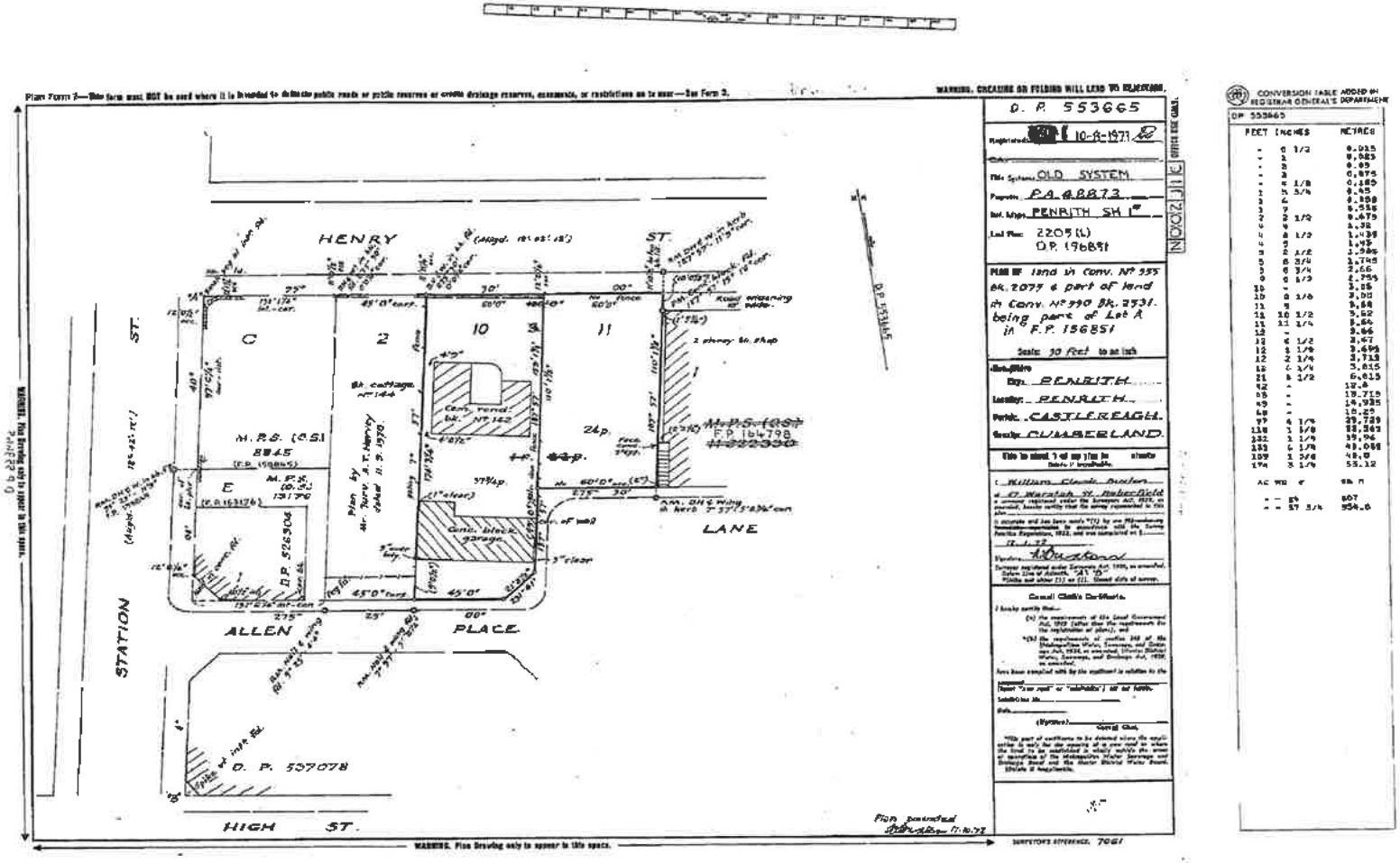

CONVERSION TABLE ADDED BY REGISTRAR GENERAL'S DEPARTMENT

D.P. 553665

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	1	0.025
	2	0.05
	3	0.075
	4 1/8	0.105
1	5 3/4	0.45
2	6	0.550
2	7	0.576
2	8 1/2	0.673
2	9	0.701
2	10 1/2	0.799
3	0	0.914
3	1	0.939
3	2 1/2	1.029
3	3 3/4	1.095
3	5	1.145
3	6 1/2	1.195
3	7 3/4	1.245
3	9	1.295
3	10 1/2	1.345
4	0	1.395
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4	2 3/4	1.495
4	4	1.545
4	5 1/2	1.595
4	6 3/4	1.645
4	8	1.695
4	9 1/2	1.745
4	10 3/4	1.795
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13	2 3/4	5.545
13	4	5.595
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I, Jack Heywood Watson, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document in my custody this 30th day of November, 1971.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R725372 /Doc:PA 048873 PA /Rev:22-Jun-2015 /Sts:OK.SC /Pgs:ALL /Prt:08-Nov-2016 09:04 /Seq:1 of 4
Ref:penrith /Src:M

No. 48873 48873

R.P. 2

NEW SOUTH WALES $=0300 STAMP DUTY

Fees:—

Lodgment 12.00
advt 5.00
Total $17.00

28/1/72

New South Wales.

APPLICATION TO BRING LANDS UNDER THE PROVISIONS OF THE REAL PROPERTY ACT, 1900

FEE SIMPLE(a)

CAUTION.—Severe penalties are provided by the Crimes Act, 1900, and the Real Property Act, 1900, for procuring a certificate of title through fraud.

(a) If a less estate, strike out "fee simple" and substitute the appropriate estate.

(b) State state full name, postal address and occupation of declarant.

I/WE(b) ROBIN ROY SPEED of 2 O'Connell Street, Sydney, Solicitor, having been duly appointed in writing as Attorney for Peter Shaw and Associates Pty. Limited for the purposes of this application

do solemnly and sincerely declare, that

(c) Here state full name and postal address of person or corporation entitled. Where a person is entitled, the occupation (if such person is male) or marital status (if female) should be stated.

(c) PETER SHAW AND ASSOCIATES PTY. LIMITED, a Company duly incorporated in the State of New South Wales and having its registered office there at 716 New South Head Road, Rose Bay..

I/we is/are seized for an Estate in fee simple(a) of all that piece of land situated at Penrith in the County of Cumberland and Parish of Castlereagh being(d)

(d) The application should be accompanied by a plan of survey unless the Registrar-General has previously dispensed therewith.

Give full description of the land, e.g., "Lot ... in Deposited Plan No. ..." (or as the case may be) ... plan No. ...", or "Lot ... in plan lodged herewith"; or "The whole ... (or specified part) ... of the land described in deed registered Book ... No. ...".

If any appurtenant easement is claimed, it must be specified in this description and in the plan.

If there be any rights of way or other rights or easements affecting the premises the particulars should be stated.

the whole of the land described in Conveyance registered number 751 Book 3001 together with right of way as shown edged red on plan endorsed on Conveyance Registered Number 195 Book 1396.

124a

Lost Plan P 180 29/2/72

(e) State whether "the whole" or "part".

(f) Insert allotment with reference to number and section on plan, if any, or if not, number of acres granted.

(g) Name of Grantee.

which land is(e) part of(f) 1000 acres originally granted to(g) DANIEL WOODRIFF by Crown grant, under the hand of the Governor of the Colony, dated the 18th day of December, 1805

And I/We hereby apply to have the land described in the above declaration brought under the provisions of the Real Property Act, and request you to issue the Certificate of Title in the name of

(h) As in marginal note (c) above. If two or more are entitled, state whether as joint tenants or tenants in common; if as tenants in common, state shares.

(h) PETER SHAW AND ASSOCIATES PTY. LIMITED of 716 New South Head Road, Rose Bay.

and I/We further declare that the owners and occupiers of adjacent lands are as follows

State whether on North, South, East or West	Name and postal address of owner	Name and postal address of occupier
NORTH	Penrith City Council	–
SOUTH	Penrith City Council	–
EAST		
WEST		

2+3+4 doc doc 19.

12193 76 to 77

28 AUG 1973

No alterations should be made by erasure. The words rejected should be scored through with the pen, and those substituted written over them, the alteration being verified by signature or initials in the margin, or noticed in the attestation.

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

And I/We further declare, that:—

(1) There is no person in possession or occupation of the said land or any part thereof adversely to my/our interest therein, and that the land is now(i) in the occupation of Peter Shaw and Associates Pty. Limited

(i) Insert "unoccupied" or "in the occupation of" adding names and addresses of tenants in full. State also nature of tenancy.

(2) There does not exist any lease or agreement for lease of the said land for any term exceeding a tenancy for one year, or from year to year,(j)

(j) If there be any Lease, add the words "except as follows" and insert particulars thereof.

(3) There does not exist any mortgage, lien, writ of execution, charge or encumbrance, will or settlement, or any deed or writing, contract, or dealing (other than such lease or tenancy as aforesaid), giving any right, claim, or interest in or to the said land, or any part thereof, to any other person than myself/ourselves(k)

(k) If there be any mortgage, lien, etc., add the words "except as follows" and insert particulars thereof.

(4) The Schedule hereon* to which my/our signature is/are affixed, and which is to be taken as part of this Declaration contains a full and correct list(l) commencing with Conveyance dated 5th August 1925 and 4th November 1954 registered No. 195 Book 1396 and Registered No 39 Book 2323 respectively of all settlements, deeds, documents, or instruments, maps, plans and papers relating to the land comprised in this application, so far as I/we have any means of ascertaining the same, distinguishing such as being in my/our possession or under my/our control, are herewith lodged and indicating where or with whom, so far as known to me/us, any others thereof are deposited. Also, that there does not exist any fact or circumstance whatever material to the title, which is not hereby fully and fairly disclosed to the utmost extent of my/our knowledge, information, and belief; and that there is not, to my/our knowledge and belief, any action or suit pending affecting the said land, nor any person who has or claims any estate, right, title or interest therein, or in any part thereof, otherwise than by virtue and to the extent of some lease or tenancy hereby fully disclosed.(m)

(l) The declaration may be qualified to the extent to which Applicant's title has been previously passed by the Registrar General by inserting the words "Commencing with Conveyance dated ..... registered ....." or as the case may be. Otherwise all documents from the Crown Grant onwards must be entered in the Schedule.

(m) If there be any exception add the words "except as follows" and insert necessary particulars.

And I/We make this solemn Declaration, conscientiously believing the same to be true and by virtue of the Oaths Act, 1900.(n)

(n) If made outside N.S.W. strike out Oaths Act, 1900, and insert reference to local Act.

And I/We certify that the within application is correct for the purposes of the Real Property Act, 1900.(o)

(o) Section 117 requires that the Certificate be signed by Applicant or his Solicitor and renders liable any person falsely or negligently certifying, to a penalty also, to damages recoverable by parties injured.

(RULE UP ALL BLANKS BEFORE SIGNING)

Made and subscribed by the abovenamed ROBIN RAY SPEED

this 27th day of January 1972

in the presence of(p) T.S. A Stewart J.P.

Signature of Applicant

(p) If made in N.S.W., this declaration must be attested by a Notary Public, Justice of the Peace or Commissioner for Affidavits. If made outside N.S.W., the declaration should be made according to the law of the State in which it is made and before a person authorised by that law to take declarations.

SCHEDULE REFERRED TO*

(TO BE SIGNED BY APPLICANT IMMEDIATELY BELOW THE LAST DOCUMENT SCHEDULED)

To include not only Title Deeds, Probates, Letters of Administration, Statutory Declarations, etc., but also the Surveyor's Plan or Statement in lieu thereof

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TO BE COMPLETED BY APPLICANT:—

(A) Documents Nos. 1 - 17 hereunder LODGED HEREWITH.

(B) Documents Nos. hereunder WHEREABOUTS UNKNOWN.

(C) Documents Nos. hereunder PERMANENTLY LODGED. Receipt Nos.

(D) Documents Nos. hereunder TO BE LODGED BY:—

Should any transaction affecting the land in this application be entered into or any alterations in the buildings or fences be made subsequent to the date of the application, but prior to the issue of the Certificate of Title, the Registrar General should be informed immediately, and all documents evidencing such transaction should be lodged.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R725372 /Doc:PA 048873 PA /Rev:22-Jun-2015 /Sts:OK.SC /Pgs:ALL /Prt:08-Nov-2016 09:04 /Seq:3 of 4
Ref:penrith /Src:M

SCHEDULE REFERRED TO—(*continued*)*

(TO BE SIGNED BY APPLICANT, IF UTILISED, IMMEDIATELY BELOW THE LAST DOCUMENT SCHEDULED)

No.	Date	Nature of Instrument	Parties	Registration Book	Registration No.	For Office use only — By whom Produced
1	5.8.25	Convey-ance	F.H. WOODRIFF to J.C. ALLEN	1396	195	✓
2	27.4.31	Mortgage	J.C. ALLEN to A.C. KEMP	1624	337	✓
3	23.2.35	Conveyance of Equity of Red'mn	J.C. ALLEN to A.C. KEMP	1711	475	✓
4	14.12.48	Convey-ance	A.C. KEMP to R.W. HANDLEY	2075	355	✓
5	26.7.50	Probate	F.H. WOODRIFF No. 365748			
6	4.11.54	Convey-ance	H.D. WOODRIFF & P.M. WOODRIFF to HANDLEYS PTY. LIMITED	2323	39	✓
7	22.7.54	Mortgage	HANDLEYS PTY. LIMITED to BANK OF NEW SOUTH WALES	2323	349	✓
8	6.4.60	Discharge of Mortgage	BANK OF NEW SOUTH WALES to HANDLEYS PTY. LIMITED	2531	989	✓
9	28.3.60	Convey-ance	HANDLEYS PTY. LIMITED to ROY WILLIAM HANDLEY	2531	990	✓
10	22.7.54	Mortgage	R.W. HANDLEY to BANK OF NEW SOUTH WALES	2313	526	✓
11	21.4.60	Discharge of Mortgage	BANK OF NEW SOUTH WALES to R.W. HANDLEY	2526	865	✓
12	30.4.62	Mortgage	R.W. HANDLEY to BAK OF NEW SOUTH WALES	2608	882	✓
13		Discharge of Mortgage	BANK OF NEW SOUTH WALES to R.W. HANDLEY	3008	513	✓
14	24.5.71	Convey-ance	R.W. HANDLEY to PETER SHAW AND ASSOCIATES PTY. LIMITED	3011	751	✓
15	30.6.71	Gov't Gazette	R.W. HANDLEY to PENRITH CITY COUNCIL (N.S.W. GOV'T GAZETTE NO. 69)			
16	20.9.63	Gov't Gazette	R.W. HANDLEY to PENRITH CITY COUNCIL (N.S.W. GOV'T GAZETTE NO. 91)			
17	5.11.63	Deposited Plan	No. 217346 showing resumptions of Land referred to in above two Gazette Notices			

Rec'd docs 1-17 28/11/72

18	14-12-72	Letter from	ERIC ANDERSON RADIO-TELEVISION P/L	} Sht. 8. & 28/11/72.
19	20.2.73	Copy of letter	from Bartier, Perry & Purcell	} Sheet 11 RN 5/3/73
20	16-5-73	Withdrawn	POWER OF ATTORNEY. - F. GORDON : BARTIER PERRY & PURCELL.	
20	23-5-73	Mem. of Non-Revoc.	Robin R. Speed, Peter Shaw & Assoc.	} Sheet 16 RC 28/5/73.
21	19-8-71	Power of Attorney		
22	3-8-73	Stat. Dec.	PETER VICTOR SHAW	} CR 8/8/73 Sheet 18.

Docs 5-9, 12-13 to return to Bartier Perry & Purcell the rest to remain.

Received above documents 5/11/73 Bartier Perry Purcell

5/11/73

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R725372 /Doc:PA 048873 PA /Rev:22-Jun-2015 /Sts:OK.SC /Pgs:ALL /Prt:08-Nov-2016 09:04 /Seq:4 of 4
Ref:penrith /Src:M

DP558665

1r. 22p.

No. 48873 28/1/71

Lodged by: Barden Carmichael

Address: 2 O'Connell Street

Phone No.: Sydney

SCHEDULE REFERRED TO—(*continued*)*

(TO BE SIGNED BY APPLICANT, IF UTILISED, IMMEDIATELY BELOW THE LAST DOCUMENT SCHEDULED)

No.	Date	Nature of Instrument	Parties	Registration Book	Registration No.	For Office use only By whom Produced

27261 9.65 N. C. N. BLIGHT, GOVERNMENT PRINTER

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R725353 /Doc:CT 12193-076 CT /Rev:03-Feb-2011 /Sts:OK.SC /Pgs:ALL /Prt:08-Nov-2016 09:02 /Seq:1 of 6
Ref:penrith /Src:M

[redacted]FICATE OF TITLE

NEW SOUTH WALES

[redacted]L PROPERTY ACT, 1900

12193076

Vol. 12193 Fol. 76

Appln. No.48873

Edition issued 24-8-1973

(Page 1) Vol. 12193 Fol. 76

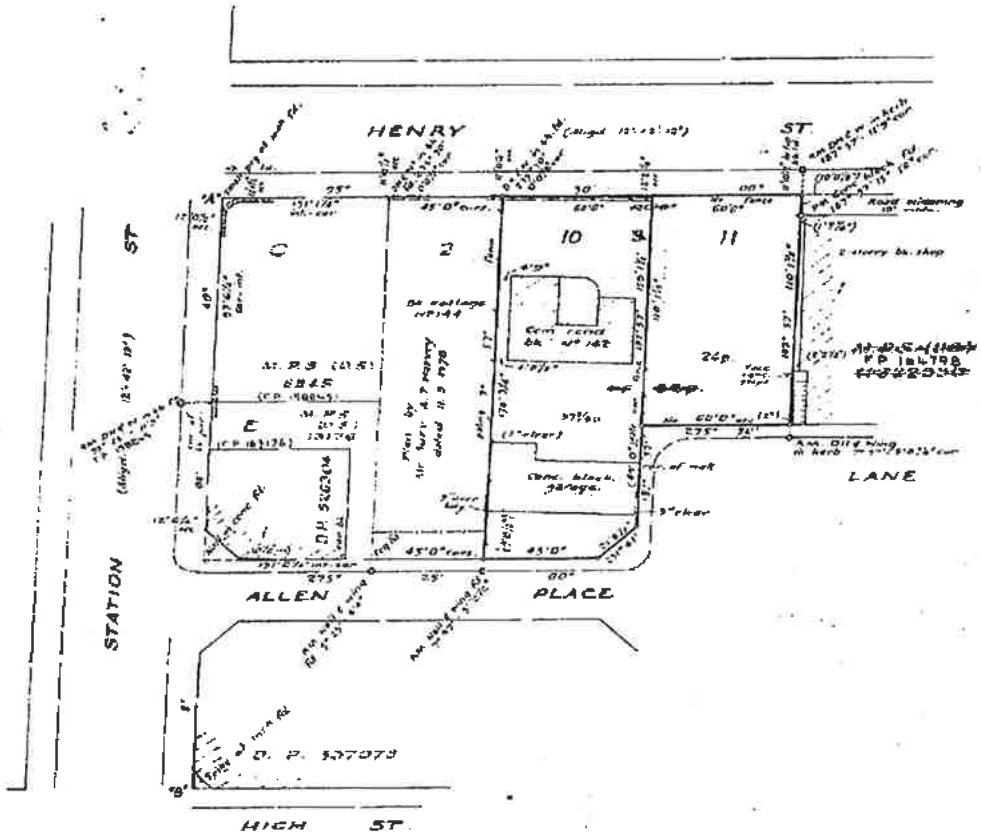
I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

CANCELLED

Registrar General.

PLAN SHOWING LOCATION OF LAND

SEE AUTO FOLIO



ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 10 in Deposited Plan 553665 in the City of Penrith Parish of Castlereagh and County of Cumberland being part of Portion 90 granted to Daniel Woodriff on 1-2-1804 and regranted on 18-12-1805.

FIRST SCHEDULE

~~PETER SHAW AND ASSOCIATES PTY. LIMITED.~~

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grant above referred to.

Registrar General

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE LAND TITLES OFFICE.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Vol. 12193 Fol. 76

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	ENTERED	Signature of Registrar General
~~A.F.G. Pty. Limited~~	~~Transfer~~	~~Q156776~~		1-9-1977	
~~Gwynvill Properties Pty. Limited by Application S638904. Registered 9-1981~~					
Penrith City Council by Transfer V656082. Registered 29-4-1985					

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	INSTRUMENT DATE	PARTICULARS	ENTERED	Signature of Registrar General	CANCELLATION		
~~Lease~~	~~P396521~~	~~——~~	~~of premises known as Shop No. 6 in the "Centre" to Chris George of Richmond, Shop Keeper and Joyce George his wife.~~	~~9-10-1975~~		~~Surrendered~~	~~Q136760~~	
~~Lease~~	~~P396522~~	~~——~~	~~of premises known as Shop No. 4 in the "Centre" to Elizabeth Katherine Vickers of Bendvick, Shopkeeper.~~	~~9-10-1975~~		~~Surrendered~~	~~Q136758~~	
~~Lease~~	~~P414643~~	~~——~~	~~of premises known as Shop No.5 in the "Centre" to Kenneth Ernest Skinner of Springwood, Shopkeeper and Kibu Ruby Rose Skinner his wife.~~	~~9-10-1975~~		~~Surrendered~~	~~Q136759~~	
~~Lease~~ ~~Mortgage~~	~~P497977~~	~~——~~	~~of premises known as Shops 2 and 3 in the "Centre" to Juno Margaret Rowe, of Cambridge Park, Married Woman, and T. & J. Wadland (Firedoek) Pty. Limited.~~	~~14-11-1975~~				
~~Lease~~	~~P497977~~	~~——~~	~~of premises known as Shops 2 and 3 in the "Centre" to Juno Margaret Rowe, of Cambridge Park, Married Woman, and T.G.J. Wadland (Fruiterers) Pty. Limited.~~	~~14-11-1975~~		~~Expired~~	~~17-3-1987~~	
~~Lease~~	~~Q136761~~	~~——~~	~~Chris George of Richmond Shopkeeper, Joyce George his wife of premises known as Shop No. 6 in the Shopping Arcade the Centre~~	~~1-9-1977~~		~~Surrendered~~	~~T889293~~	
~~Lease~~	~~Q136762~~	~~——~~	~~Kenneth Ernest Skinner of Springwood Shopkeeper, Kibu Ruby Rose Skinner his wife, of premises known as Shop No.4 in the Shopping Arcade the Centre. Expires 28-6-1980~~	~~1-9-1977~~		~~Expired~~	~~29-4-1985~~	

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Req:R725353 /Doc:CT 12193-076 CT /Rev:03-Feb-2011 /Sts:OK.SC /Pgs:ALL /Prt:08-Nov-2016 09:02 /Seq:2 of 6
Ref:penrith /Src:M
Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R725353 /Doc:CT 12193-076 CT /Rev:03-Feb-2011 /Sts:OK.SC /Pgs:ALL /Prt:08-Nov-2016 09:02 /Seq:3 of 6
Ref:penrith /Src:M

SECOND SCHEDULE (continued)

OF PART OF THE PREMISES KNOWN AS 140-142 HENRY STREET, PENRITH

INSTRUMENT NATURE	INSTRUMENT NUMBER	Shop	LESSEES	DATE OF EXPIRY	REGISTERED	Signature of Registrar General	CANCELLATION
Lease -	R231819	4	to Ronald Raymond Rowe of Cambridge Park, Shop Proprietor and June Margaret Rowe his wife as joint tenants, together with option of renewal	28-2-1982	8-2-1960		30-7-1982
Lease	Q136761		AFFECTED BY A723428 TRANSFER OF LEASE TO NICHOLAS TSELEPIS OF WERRINGTON SHOPKEEPER AND CHRISTINA TSELEPIS HIS WIFE AS JOINT TENANTS				
				22-3-1990			T889293
223619 Lease		Lessees: John Arthur Freeburn in ½ share and Wendy Margaret Freeburn in ½ share as tenants in common by Transfer S406634 Registered 13-4-1981.					
Lease T165846	R231819 Lease	4	to Helge Schmidt and Janice Schmidt as tenants in common by Transfer S798420. to Helge Schmidt and Janyce Schmidt as tenants in common, together with option of renewal.		25-11-1981.		30-7-1982 T165846 30-7-1982
T165846	Lease.	LESSEE:	Patora Pty. Limited by Transfer T556651.	28-2-1987	30-7-1982		
Lease	T950827	5 and 6	to Peter Camilleri, Maria Ann Camilleri, Charles Camilleri and Leina Camilleri - for tenancy see Dealing - together with an option of renewal.	31-7-1988	30-5-1983. 14-2-1984		Surrendered W656081
T165846 W606576 P	Lease. P W738170 Request: Shop No. 4 has been renumbered as Shop No. 2. Registered 17-3-1987 Lease to Steadfast Enterprises Limited of premises being Shops 4 and 5 in the building known as The Allen Arcade as shown in the plan with W606576. Expires 28-2-1989. Option of renewal 3 years. Registered 17-3-1987						
W749127 P	Lease to Leonardo Gulisano and Connie Nella Gulisano as joint tenants of premises being Shop 6 in the building known as The Allen Arcade as shown hatched black in plan with W749127. Expires 28-2-1989. Option of renewal 3 years. Registered 17-3-1987						
Lease	X54963	3	to George Toutounji and Georgette Toutounji				
X54963 P	Lease to George Toutounji and Georgette Toutounji as joint tenants of Shop 3 in premises known as The Allen Arcade as shown hatched black in plan with X54963. Expires 13.11.1989. Option of renewal 3 years Registered 4.11.1987						
X54963 P	Lease. X651794 Lease now Hafele Pty Limited Registered 4.11.1987.						

CANCELLED

SEE AUTO FOLIO

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

R723428 T/L (Q136761) (R) S406634 T/L (Q231819 L) S636604 CN S798420 T165846 L R T556651 T/L lep T889293 LR J950827 (affects 5 & 6) V656081S R 2TE W606576 Lse W738170 Reg W749127 Lse (Shop 6) X54963 LR X651794 LR

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

SECOND SCHEDULE (continued)

OF PART OF THE PREMISES KNOWN AS 140-142 HENRY STREET, PENRITH .

INSTRUMENT		SHOP	LESSEES	DATE OF EXPIRY	REGISTERED	Signature of Registrar General	CANCELLATION
NATURE	NUMBER						

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Page 4

VOL.

FOL.

Req:R725353 /Doc:CT 12193-076 CT /Rev:03-Feb-2011 /Sts:OK.SC /Pgs:ALL /Prt:08-Nov-2016 09:02 /Seq:4 of 6
Ref:penrith /Src:M

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R725353 /Doc:CT 12193-076 CT /Rev:03-Feb-2011 /Sts:OK.SC /Pgs:ALL /Prt:08-Nov-2016 09:02 /Seq:5 of 6
Ref:penrith /Src:M

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Historical Title

Information Provided Through
John McLaren & Co (NSW)
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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
8/11/2016 9:00AM

FOLIO: 10/553665

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 12193 FOL 76

Recorded	Number	Type of Instrument	C.T. Issue
28/3/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
30/8/1988		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
20/6/1989	Y404325	LEASE	EDITION 1
24/9/1992	E783655	DEPARTMENTAL DEALING	
12/10/1992	E766866	LEASE	EDITION 2
7/10/1993		AMENDMENT: LOCAL GOVT AREA	
9/6/1994	U339011	LEASE	EDITION 3
15/4/1997	2977154	LEASE	EDITION 4
24/6/1997	3170479	LEASE	EDITION 5
3/12/1997	3636638	LEASE	EDITION 6
15/1/1998	3733152	LEASE	EDITION 7
6/11/2000	6575982	REQUEST	
6/11/2000	6575983	LEASE	EDITION 8
13/6/2002	8682054	LEASE	EDITION 9
22/10/2004	AB40251	SURRENDER OF LEASE	
22/10/2004	AB40252	LEASE	EDITION 10
21/3/2005	AB360901	LEASE	EDITION 11
5/8/2005	AB678272	LEASE	EDITION 12
20/10/2005	AB852063	LEASE	EDITION 13
2/12/2005	AB958646	LEASE	EDITION 14

END OF PAGE 1 - CONTINUED OVER

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
8/11/2016 9:00AM

FOLIO: 10/553665 PAGE 2

Recorded	Number	Type of Instrument	C.T. Issue
20/8/2007	AD352780	LEASE	EDITION 15
14/12/2007	AD638015	LEASE	
14/12/2007	AD638016	LEASE	EDITION 16
6/8/2008	AD885705	SURRENDER OF LEASE	
6/8/2008	AD885706	LEASE	
6/8/2008	AE71200	LEASE	EDITION 17
14/5/2010	AF492235	LEASE	EDITION 18
16/9/2010	AF761963	LEASE	EDITION 19
13/3/2012	AG865542	LEASE	EDITION 20
12/4/2013	AH662235	LEASE	EDITION 21
28/1/2014	AI331195	LEASE	EDITION 22
9/7/2014	AI722676	LEASE	
9/7/2014	AI722677	LEASE	EDITION 23
25/7/2014	AI761352	LEASE	EDITION 24
28/1/2015	AI898777	LEASE	EDITION 25
4/9/2015	AJ787670	LEASE	EDITION 26

*** END OF SEARCH ***

penrith PRINTED ON 8/11/2016

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Title Search

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 10/553665

SEARCH DATE	TIME	EDITION NO	DATE
8/11/2016	9:05 AM	26	4/9/2015

LAND

LOT 10 IN DEPOSITED PLAN 553665
LOCAL GOVERNMENT AREA PENRITH
PARISH OF CASTLEREAGH COUNTY OF CUMBERLAND
TITLE DIAGRAM DP553665

FIRST SCHEDULE

PENRITH CITY COUNCIL (T V656082)

SECOND SCHEDULE (9 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 AF761963 LEASE TO AUSTRALIAN HEARING SERVICES OF SHOP 7, ALLEN ARCADE, 140-142 HENRY STREET, PENRITH & CAR SPACES NO: 6 & 7. EXPIRES: 31/5/2013. OPTION OF RENEWAL: THREE YEARS.
3 AH662235 LEASE TO NEPEAN INDEPENDENT LIVING COMMITTE INCORPORATED OF SHOP 6 ALLEN ARCADE 140-142 HENRY STREET PENRITH INCLUDING CAR SPACE NO. 5. EXPIRES: 31/3/2016.
4 AI331195 LEASE TO TARA MARIE BATTISHILL OF SHOP 3, ALLEN ARCADE, 140-142 HENRY STREET, PENRITH. EXPIRES: 31/8/2016. OPTION OF RENEWAL: 3 YEARS.
5 AI722676 LEASE TO ACADEMIES AUSTRALASIA PTY LTD OF SHOP 8, ALLEN ARCADE, 140-142 HENRY STREET, PENRITH AND CAR SPACE NO. 8. EXPIRES: 28/2/2017. OPTION OF RENEWAL: 3 YEARS.
6 AI722677 LEASE TO REJUVEN8 BODY STUDIO AUSTRALIA PTY LIMITED OF SHOP 1, ALLEN ARCADE, 140-142 HENRY STREET, PENRITH AND CAR SPACES NO. 1 AND 2. EXPIRES: 28/2/2017. OPTION OF RENEWAL: 3 YEARS.
7 AI761352 LEASE TO ACADEMIES AUSTRALASIA PTY LTD OF SHOP 10, ALLEN ARCADE, 140-142 HENRY STREET, PENRITH & CAR SPACE NUMBERED 9. EXPIRES: 28/2/2017. OPTION OF RENEWAL: 3 YEARS.
8 AI898777 LEASE TO CLB PROPERTY GROUP PTY LTD BEING SHOPS 4 AND 5, ALLEN ARCADE, 140-142 HENRY STREET PENRITH. EXPIRES: 14/8/2017. OPTION OF RENEWAL: THREE (3) YEARS.
9 AJ787670 LEASE TO MC TUITION PTY LTD OF ALLEN ARCADE, SUITE 9, 140-142 HENRY STREET, PENRITH INCLUDING CAR PARKING

END OF PAGE 1 - CONTINUED OVER

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

FOLIO: 10/553665 PAGE 2

SECOND SCHEDULE (9 NOTIFICATIONS) (CONTINUED)

SPACES NUMBERED 1 & 2. EXPIRES: 28/2/2018.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register. InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act 1900.

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Version: 1, Version Date: 14/04/2021

scottASHWOOD PTY.LTD
An InfoTrack Company

ABN: 42 166 543 255
Ph: 02 9099 7400
Fax: 02 9232 7141
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Summary of Owners Report

LPI **Sydney**

Address: 118 – 120 Henry Street, Penrith

Description: - Lot 1 D.P. 113118

As regards the parts tinted yellow and numbered 1 & 1A on the attached Cadastral

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
21.6.1881 (1881 to 1936)	Francis Henry Woodriff (Gentleman)	Book 222 No. 132
18.4.1936 (1936 to 1939)	Emily Doolan (Married Woman)	Book 1747 No. 31
20.5.1939 (1939 to 1949)	Mabel Sarah Victoria Kemp (Married Woman)	Book 1846 No. 686
10.9.1940 (1949 to 1967)	Geoffrey Howard Upton (Sports Store Proprietor)	Book 2098 No. 958
1959	The part that we have numbered 1A on the attached cadastral became Council Public Road upon the approval of D.P. 164798, circa 1959 This road was subsequently closed The first title to issue after the road closure is Volume 13759 Folio 102 dated 20.12.1978, issuing in the name of Allen Holdings (Australia) Pty Limited	
6.3.1967 (1967 to 1973)	George Alwyn Power (Garage Proprietor)	Book 2839 No. 396
28.2.1973 (1973 to 1977)	Galvina Pty Limited	Book 3084 No. 905
21.7.1977 (1977 to 1980)	Altco Holdings Pty Limited Then Allen Holdings Pty Limited Now Allen Holdings (Australia) Pty Limited	Book 3284 No. 90 Now Vol 13820 Fol 105

As regards the parts tinted yellow and numbered 2 & 2A on the attached Cadastral

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
21.6.1881 (1881 to 1947)	Francis Henry Woodriff (Gentleman)	Book 222 No. 132
27.3.1947 (1947 to 1967)	Geoffrey Howard Upton (Boot Repairer)	Book 2025 No. 280
1959	The part that we have numbered 1A on the attached cadastral became Council Public Road upon the approval of D.P. 164798, circa 1959 This road was subsequently closed The first title to issue after the road closure is Volume 13759 Folio 102 dated 20.12.1978, issuing in the name of Allen Holdings (Australia) Pty Limited	
6.3.1967 (1967 to 1973)	George Alwyn Power (Garage Proprietor)	Book 2839 No. 396
28.2.1973 (1973 to 1977)	Galvina Pty Limited	Book 3084 No. 905
21.7.1977 (1977 to 1980)	Altco Holdings Pty Limited Then Allen Holdings Pty Limited Now Allen Holdings (Australia) Pty Limited	Book 3284 No. 90 Now Vol 13820 Fol 105

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

scottASHWOOD PTY.LTD
An InfoTrack Company

ABN: 42 166 543 255
Ph: 02 9099 7400
Fax: 02 9232 7141
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

As regards the parts tinted yellow and numbered 3 & 3A on the attached Cadastral

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
21.6.1881 (1881 to 1947)	Francis Henry Woodriff (Gentleman)	Book 222 No. 132
27.3.1947 (1947 to 1947	Charles William Owen Roberts (Electrician)	Book 2032 No. 575
9.10.1947 (1947 to 1967)	Geoffrey Howard Upton (Boot Repairer)	Book 2033 No. 174
1959	The part that we have numbered 1A on the attached cadastral became Council Public Road upon the approval of D.P. 164798, circa 1959 This road was subsequently closed The first title to issue after the road closure is Volume 13759 Folio 102 dated 20.12.1978, issuing in the name of Allen Holdings (Australia) Pty Limited	
6.3.1967 (1967 to 1973)	George Alwyn Power (Garage Proprietor)	Book 2839 No. 396
28.2.1973 (1973 to 1977)	Galvina Pty Limited	Book 3084 No. 905
21.7.1977 (1977 to 1980)	Altco Holdings Pty Limited Then Allen Holdings Pty Limited Now Allen Holdings (Australia) Pty Limited	Book 3284 No. 90 Now Vol 13820 Fol 105

Search continued as to the whole of the subject land

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
6.3.1980 (1980 to 1987)	OPF Nominees Pty Limited	Vol 13820 Fol 105
6.10.1987 (1987 to 2006)	Alfred Moss Investments Pty Limited	Vol 13820 Fol 105 Now 1/113118
18.10.2006 (2006 to Date)	# Penrith City Council	1/113118

# Denotes Current Registered Proprietors

Easements: -NIL

Leases: -

- 26.8.1959 Book 2561 No. 478 – Caltex Oil (Australia) Pty Limited – expired or surrendered – not investigated
- 30.3.1977 Book 2841 No. 438 – Caltex Oil (Australia) Pty Limited – surrendered 28.2.1973 Book 3090 No. 208
- 29.11.1977 Book 3303 No. 214 – Pauls (Merchants) Pty Limited – expired or surrendered – not investigated
- Numerous Leases dated from 21.6.1993 to 12.4.2013 – expired or surrendered – not investigated
- 28.5.2015 AJ526510 – Specialty Fashion Group Limited – expires 31.7.2019 – option of renewal 5 years

Yours Sincerely
James McDonnell
14 October 2016

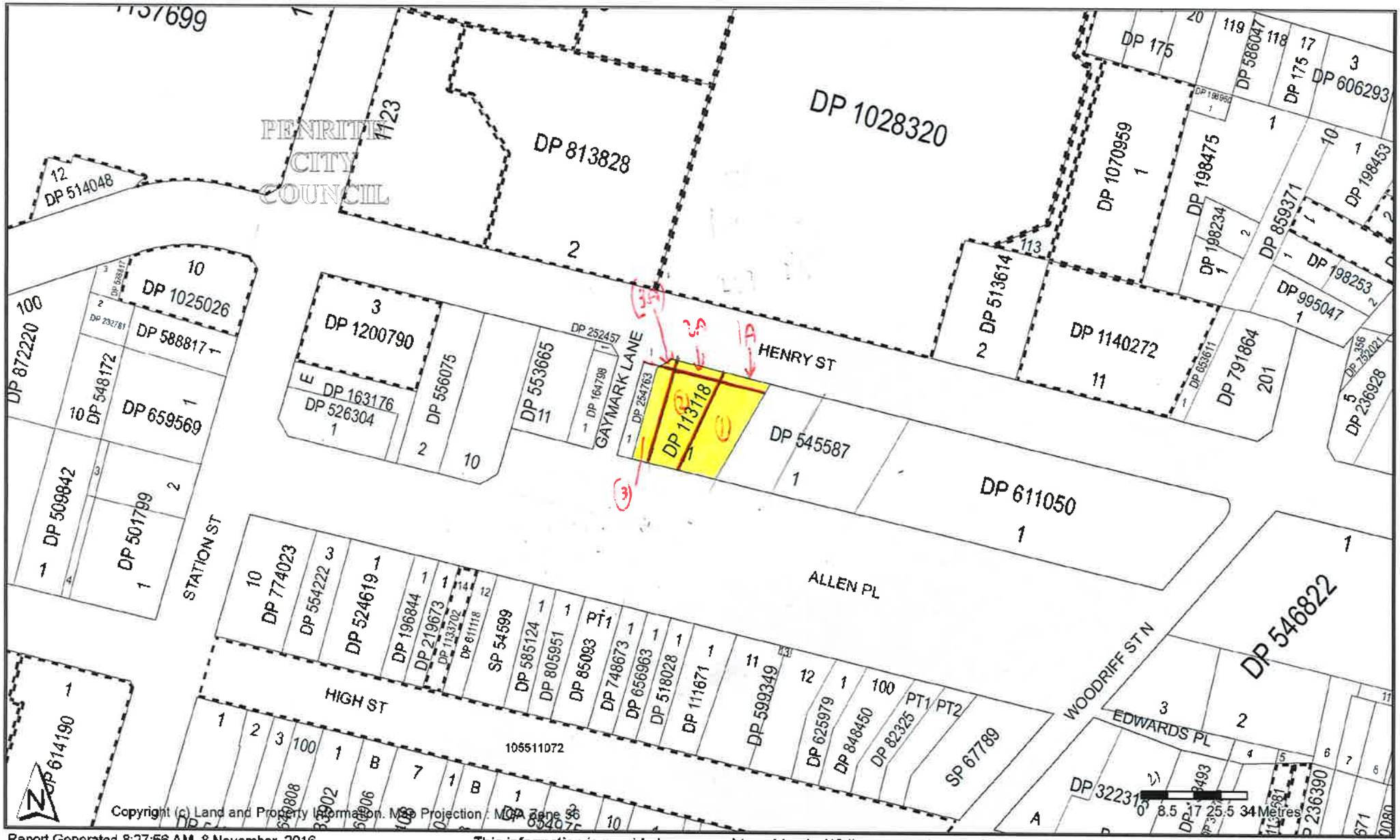
Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Land & Property Information

Cadastral Records Enquiry Report

Requested Parcel : Lot 1 DP 113118 **Identified Parcel** : Lot 1 DP 113118

Locality : PENRITH LGA : PENRITH **Parish** : CASTLEREAGH **County** : CUMBERLAND



Report Generated 8:27:56 AM, 8 November, 2016

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This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R727778 /Doc:DP 0164798 P /Rev:22-Dec-1992 /Sts:OK.OK /Pgs:ALL /Prt:08-Nov-2016 11:28 /Seq:1 of 1
Ref:penrith /Src:M

DP 164798
MPS (OS) HC22330

This margin to be left free from endorsement

PLAN of subdivision of Lots B and C MPS(OS)1638/ and Lot E MPS(OS)1081 Parish of Castlereagh County of Cumberland

Scale: 50 feet to an inch

Upon 28/74

STATION ST

HENRY ST

SOFT WATER LANE

Signed 17.4.17

Note: The flood widening 0.11 metre on the western side of Henry Street is hereby declared to be public road.

Note: The flood widening 0.11 metre on the eastern side of Henry Street is hereby dedicated to the public as road.

Darkens over of Agreement No. 7

Signatures of parties to be made in this margin.

TAK is the plan marked "A" referred to in

Dated

I, Bryce Richard Doyle, Registrar General for New South Wales, certify that this negative is a photograph made as a permanent record of a document lawfully dealt with by me on the 22nd day of November, 1977

Registrar General

Lots	Feet	Inches	Hectares
1	0	1/8	0.0029
2	0	5/8	0.0121
3	0	3/8	0.0069
4	0	2/8	0.0052
5	0	3/8	0.0086
6	0	3/8	0.0086
7	0	3/8	0.0086
8	0	3/8	0.0086
9	0	3/8	0.0086
10	0	3/8	0.0086
11	0	3/8	0.0086
12	0	3/8	0.0086
13	0	1/2	0.0095
14	0	7/8	0.0103
15	0	1/8	0.0026
16	0	1/8	0.0026
17	0	1/8	0.0026
18	0	1/8	0.0026

PUBLIC ROADS ACT, 1902. PLAN OF PROPOSED ROAD PAPERS Roads 17/962

PARISH CASTLEREAGH COUNTY CUMBERLAND

LAND DISTRICT PENRITH CITY OF PENRITH

Width of Proposed Road VARIABLE

Lands proposed to be resumed for road are shown edged red LOT 1 (DEPTH RESTRICTION 20 METRES)

Roads proposed to be closed are shown edged blue LOT 2

DP254763

Registered

Purpose PUBLIC ROADS ACT 1902

Ref Map LIB 940 62*

DP 255743

HENRY STREET

(PUBLIC ROAD 20·15 WIDE)
(ALIGNED 346 - 126 - 346)

FACE OF TILES

FACE OF BRICK

K.A&C

RMDH&W FD (DP 565587)

LOT 2 34·495 32°55" 29' 101·7m²

FCE OF BK

20' 65·72

FCE OF BRICK

PT A

LOT 1

ALCO HOLDINGS PTY LIMITED

PT 3

FP 164798

OLD SYSTEM LAND

DP 565587

GAYMARK LANE

12·28 WIDE (AS WIDENED)

FACE OF BK WALL OF FP 164798

MBS (DS) 6951

18·25 27°5' 6·532

7·99 25°

27·35 20°

ALLEN PLACE

B ROAD WIDENING 3·05 WIDE FP 164798

ACCEPTED PLAN NOT CHECKED IN THE DEPT OF LANDS.

REFERENCE MARKS

COR	BEARING	DIST	FROM
A	95° 29'	0·635	RMDH&W
B	163° 29'	4·91	RMDH&W
C	95° 29'	5·765	RMDH&W

VINCENT JOHN MORGAN
PO BOX 227 PENRITH

AUTHORITY TAKEN FROM X - Y
FIELD BOOK L.D. 78 (9 PAGES 21 & 22) (DCS)

REDUCTION RATIO 1:400 LENGTHS ARE IN METRES.

I, Bruce Richard Doyle, Registrar General for New South Wales, certify that this negative or photographic work is a permanent record of a document in my custody this 13th day of October, 1971

Req:R727725 /Doc:DP 0254753 P /Rev:26-Jun-1992 /Sts:OK.OK /Pgs:ALL /Prt:08-Nov-2016 11:26 /Seq:1 of 1

Ref:penrith /Src:M

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R725525 /Doc:DP 0113118 P /Rev:23-Dec-1992 /Sts:OK.OK /Pgs:ALL /Prt:08-Nov-2016 09:15 /Seq:1 of 1
Ref:penrith /Src:M

PLAN OF LOT 2 IN D.P. 254763 & PART OF LOT 303 IN D.P. 593084

D.P. 113118

Municipality / City: PENRITH
Locality: PENRITH
Parish: CASTLEREAGH
County: CUMBERLAND
Reduction Ratio 1: 500
Lengths are in metres

Registered: 19-1-1978
C.A.:
Title System: TORRENS SYSTEM
Purpose: DEPARTMENTAL
Ref. Map: 9760-62
Last Plan: D.P. 254763

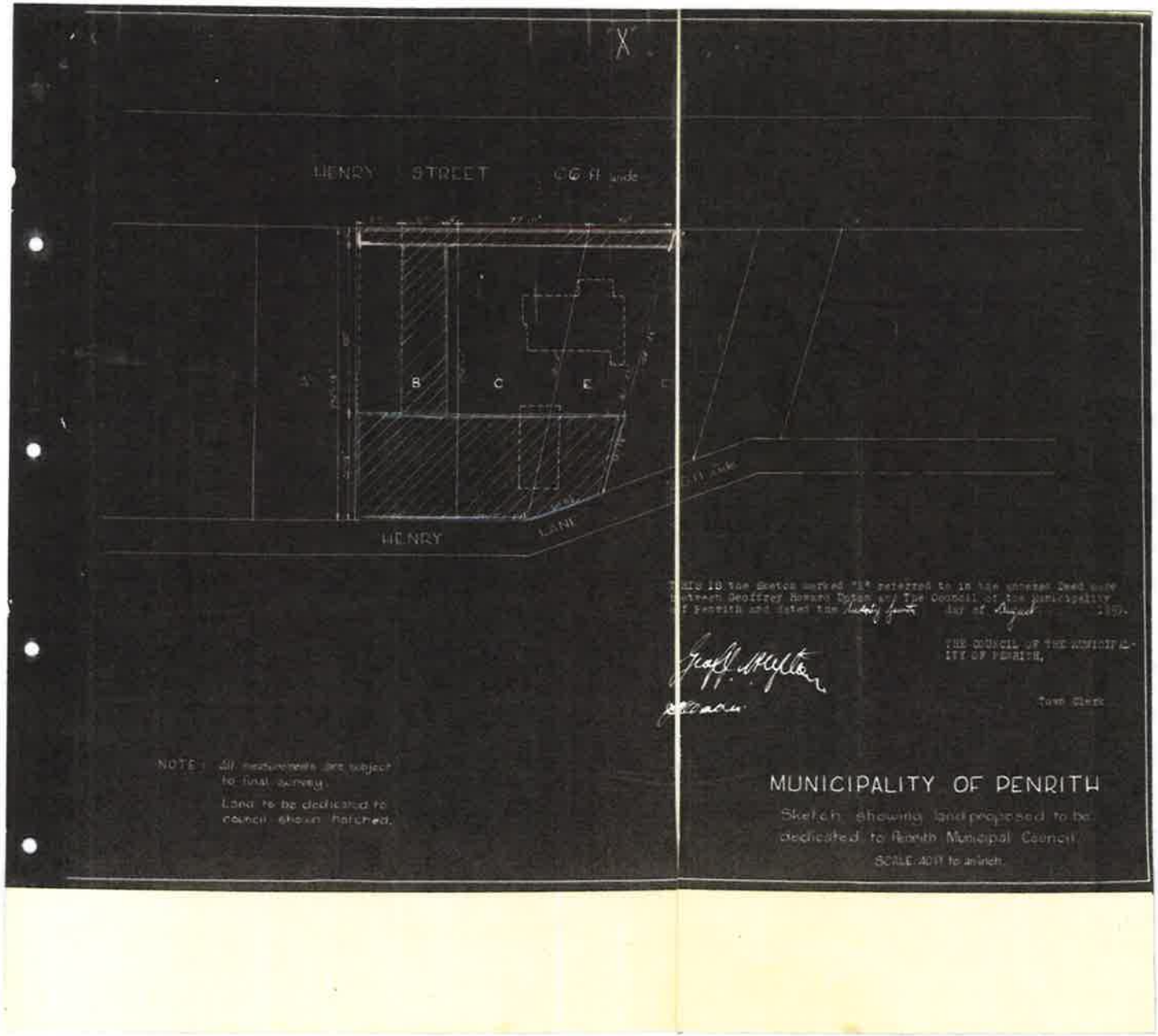
Prepared in Registrar General's Office
Amd:

N O O I D I F

I, Bruce Richford Davies, Registrar General for New South Wales, certify that this photocopy made by a permanent process is a true copy of Deposited Plan 113118 dated the 19th day of January, 1978.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Staff: Unknown /Doc: undefined (General Register of Deeds (Old System Deeds)-All Collections) /Rev: 12 Aug 2014 /Prt: 9 Nov 2016 10:38 /Seq: 7 of 8 /Src: Pixel
Warning: null



Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R725586 /Doc:PA 053286 PA /Rev:22-Jun-2015 /Sts:OK.SC /Pgs:ALL /Prt:08-Nov-2016 09:19 /Seq:1 of 5
Ref:penrith /Src:M

Hppn. 37286.

53286

NEW SOUTH WALES

PRIMARY APPLICATION

SECTION 14, REAL PROPERTY ACT, 1900

STAMP DUTY $

OFFICE USE ONLY

$ 20

Paid on 4569. 4/11/77

CAUTION.—Severe penalties are provided by the Crimes Act, 1900, and the Real Property Act, 1900, for procuring a certificate of title through fraud.

Typewriting and handwriting should be clear, legible and in permanent black non-carrying ink. No alterations should be made by erasure; the words rejected must be ruled through and verified by signature or initials in the margin.

(a) Full name and postal address of person or corporation entitled to the land. If a person is entitled, the occupation should also be stated.

(a) * ALTCO HOLDINGS PTY. LIMITED of 40 Yeo Street, Neutral Bay.

hereinafter referred to as the APPLICANT

hereby applies to have the undermentioned land brought under the provisions of the Real Property Act, 1900

(b) Give an adequate description of the land, e.g. "Lot — in Deposited Plan —". If an appurtenant easement is claimed, the deed creating it should be disclosed and an adequate description of its location should be given; its location should also be shown on the plan.

The application should be accompanied by a plan of survey unless the Registrar General has previously dispensed therewith. A plan is not normally required where the application relates to land in a qualified certificate of title; in such case it will be sufficient to describe the land by reference to the volume and folio number of the qualified certificate of title.

(c) Delete whichever is inapplicable.

(d) Insert reference to portion or allotment, or if none, to number of acres granted.

(e) Name of grantee.

All that piece of land situated at Penrith in the County of Cumberland Parish of Castlereagh being(b) Lot 3 in Miscellaneous Plan of Subdivision (Old System) No. 14798 (now Filed Plan No. 164798)

and being ~~the whole(c)~~ part of(d) Daniel Woodriff's 1000 acre ~~granted to(e) by Crown grant dated the day of~~

and requests that the certificate of title issue in the name of

(f) If the certificate of title is required to issue in favour of the applicant, insert "the applicant"; otherwise here insert the full name of the person or corporation in whose name the certificate of title is to issue. In the case of a person, the full postal address and occupation should also be stated.

If more than one nominee, state whether as joint tenants or tenants in common.

Unless otherwise stated, tenants in common will be presumed to hold in equal shares.

(f) the applicant

and in support of this application I/We(g) GLYN TERRINGTON THOMAS of 53 Acacia Avenue, Ryde, Company Secretary (Nov. date 39).

(g) Full name, address and occupation of deponent.

(h) If a lesser estate, alter accordingly.

solemnly and sincerely declare that—

1. The applicant is seised for an estate in fee simple(h) of the abovedescribed land.

(i) Delete whichever is inapplicable.

2. There is no person in possession or occupation of the said land or any part thereof adversely to the estate or interest therein of the applicant.

3. The said land is now(i) ~~occupied by the persons specified in the First Schedule as occupiers.~~ unoccupied.

4. There does not exist any lease or agreement for lease of the said land for any term exceeding a tenancy for one year, or from year to year, except as set out in the First Schedule.

5. There does not exist any right of way, right of drainage or other easement or any restrictive covenant affecting the said land, except as disclosed in the First Schedule.

(j) Should any transaction affecting the land in this application be entered into or any alterations in the buildings or fences be made subsequent to the date of the application, but prior to the issue of the certificate of title, the Registrar General should be informed immediately, and all documents evidencing such transaction should be lodged.

6. There does not exist any mortgage, lien, writ of execution, order, charge, encumbrance, will, settlement, deed, writing, contract, or dealing giving any right, claim or interest in the said land, or any part thereof, to any person other than the applicant except as set out in the First Schedule; nor, to the best of my knowledge and belief, is there any action, proceeding or suit pending which affects or could affect the said land, or any person other than the applicant who has or claims any estate, right, title or interest therein, except as disclosed in the First Schedule.(j)

7. There is no resumption or instrument whereby minerals or substrata have been excepted or reserved to any person, except as disclosed in the First Schedule.

(k) The declaration may be qualified, e.g. by inserting the words "commencing with conveyance dated ——— registered Book ——— No. ———" or as the case may be. See also notes on back page hereof.

8. The Second Schedule contains a full and correct list(k) commencing with Conveyance dated 18th April, 1936 registered Book 1747 No. 31.

of all settlements, deeds, documents, instruments, maps, plans and papers relating to the said land so far as I have any means of ascertaining them. All such documents as are in my possession or under my control are lodged herewith; the whereabouts of all other documents listed, so far as is known to me, is stated in such list.

9. The applicant has not become bankrupt or assigned his estate for the benefit of creditors.

Cert. of T., issued Vol 13820 Fol 105 Dated —5 MAR 1979

* Now "ALLEN HOLDINGS PTY LIMITED" see Book 4144 No 776

Lot 4 DP 254763 known as 1 Eyk Road

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

10. The information shown in the Schedules hereto is to be taken as part of this declaration.

11. I have been authorised by power of attorney dated the TENTH day of OCTOBER, 1977 to make this application on behalf of the applicant, and I have received no notice of revocation of such authority.(f)

(f) Delete this clause if inapplicable. The relevant power of attorney or other such authority should be lodged with the application.

I make this solemn declaration conscientiously believing the same to be true and by virtue of the Oaths Act, 1900,(m) and certify this application to be correct for the purposes of the Real Property Act, 1900.(n)

(m) If made outside N.S.W., strike out Oaths Act, 1900 and insert reference to local Act.

(n) Any person falsely or negligently certifying is liable to the penalties provided by section 117 of the Real Property Act, 1900.

Made and subscribed at Sydney the TENTH day of OCTOBER, 1977,

in the presence of

Signature of witness

WALTER P. WARREN.
Name of witness (BLOCK LETTERS)

JUSTICE OF PEACE.
Qualification of witness

Applicant, or authorised agent of applicant(o)

(o) This application is a statutory declaration and must be made before a prescribed functionary. Attention is drawn to the penalties provided by law for any false statement therein.

CONSENT OF MORTGAGEE

MERCANTILE PACIFIC FINANCE LIMITED, being the mortgagee under mortgage registered Book 3292 Number 176, hereby join in and consent to this application subject to:—(p)

(p) Delete whichever is inapplicable.

(i) registration of a mortgage under the Real Property Act, 1900 in substitution for such mortgage, ~~OR entry on the certificate of title to issue of a notification relating to such mortgage~~, AND

(ii) delivery to me of the certificate of title.

The Common Seal of MERCANTILE PACIFIC FINANCE LIMITED was hereunto affixed in the presence of:-

Director Secretary

Witness

Mortgagee

FIRST SCHEDULE

PARTICULARS OF SUBSISTING INTERESTS (LEASES, EASEMENTS, MORTGAGES AND OTHER MATTERS REFERRED TO IN CLAUSES 3 TO 7 INCLUSIVE OF DECLARATION)

Full name and address (of occupier, lessee, mortgagee, etc.)	Nature of entitlement ("occupier", "lessee", "mortgagee", etc.)	Particulars of instrument (if any) by which entitlement created(q)
PAULS (MERCHANTS) PTY. LIMITED	Lessee	Agreement for Lease dated 19th July, 1977 (as amended by deed of variation dated 13th September, 1977) pursuant to which the Lessee will be entitled to occupy the land as tenant for a term of 15 years from the date of completion of the building to be erected thereon.
MERCANTILE PACIFIC FINANCE LIMITED	Mortgagee	Mortgage dated 23rd September, 1977 Registered Book 3292 No. 176.

(q) Where the whole or any part of the land is occupied by a tenant state also the nature and duration of the tenancy.

AT 4084 K 1977

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

SECOND SCHEDULE

(See notes on back page hereof)

LP 33377
33878

DOCUMENTS REFERRED TO IN CLAUSE 8 OF DECLARATION

To be completed by declarant

Documents Nos. hereunder LODGED HEREWITH

Documents Nos. 11 hereunder WHEREABOUTS UNKNOWN

Documents Nos. 1 & 2 hereunder PERMANENTLY LODGED

Receipt Nos. 19780.

Documents Nos. 3-9, 12-14, 17 & 18 hereunder TO BE LODGED BY: Messrs. McDonald, Baker & Gill, 16 Spring Street, Sydney. 35

Documents Nos. 10 (Certified copy) 15, 16 & 19-28 hereunder to be lodged by: Messrs. Gadens, 175 Pitt Street, Sydney. (Now McCulloch & Buggy)

No.	Date	Nature of document	Parties	Registration Book	Registration No.	FOR OFFICE USE ONLY By whom produced
1	18.4.1936	Conveyance	Francis Henry Woodriff and Emily Doolan			
2	20.5.1939	Conveyance	Emily Doolan and Mabel Sarah Victoria Kemp	1747	31	
3	27.3.1947	Conveyance	Francis Henry Woodriff and Geoffrey Howard Upton	1846	686	
4	27.3.1947	Conveyance	Francis Henry Woodriff and Charles William Owen Roberts	2025	280	✓
5.	9.10.1947	Conveyance	Charles William Owen Roberts and Geoffrey Howard Upton	2032	575	✓
6	10.9.1949	Conveyance	Mabel Sarah Victoria Kemp and Geoffrey Howard Upton	2033	174	✓
7	24.3.1953	Mortgage	Geoffrey Howard Upton and The Mutual Life and Citizens' Assurance Company Limited	2098	958	✓
8.	19.10.1955	Mortgage	Geoffrey Howard Upton and Minnie Eveline East	2245	329	✓
9	10.5.1956	Discharge of Mortgage	Minnie Eveline East and Geoffrey Howard Upton (endorsed on Mortgage Book 2354 No. 633)	2354	633	✓
10	24.8.1959	Deed of Covenant	Geoffrey Howard Upton and The Council of the Municipality of Penrith	2368	971	✓
11	26.8.1959	Lease	Geoffrey Howard Upton and Caltex Oil (Australia) Pty. Limited	2526	155	
12	27.8.1959	Mortgage	Geoffrey Howard Upton and Caltex Oil (Australia) Pty. Limited	2561	478	
13	30.5.1960	Mortgage	Geoffrey Howard Upton and Robert Norman Wylie	2510	402	✓
14	18.1.1962	Discharge of Mortgage	Robert Norman Wylie and Geoffrey Howard Upton (endorsed on Mortgage Book 2527 No. 52)	2527	52	✓
15	17.8.1964	Mortgage	Geoffrey Howard Upton and Edward Beach Andrews	2640	432	✓
16	22.9.1964	Office Copy Will	Edward Beach Andrews deceased. (Died 24th January, 1965: Probate No. 599053 granted to Lilian Rose Wright and Harry John Baker 23rd September, 1965)	2717	92	✓ See Sheets 4 & 5
17	1.10.1964	Discharge of Mortgage	Caltex Oil (Australia) Pty. Limited and Geoffrey Howard Upton (endorsed on Mortgage Book 2510 No. 402)	2717	91	✓
18	1.10.1964	Discharge of Mortgage	The Mutual Life and Citizens' Assurance Company Limited and Geoffrey Howard Upton (endorsed on Mortgage Book 2245 No. 329)	2717	90	✓
19	2-10-1964	Mortgage	Geoffrey Howard Upton and Edward Beach Andrews	2717	926	✓
20	18.11.1966	Re-conveyance	Lilian Rose Wright, Harry John Baker and Geoffrey Howard Upton (re Mortgage Book 2717 No. 926)	2839	395	See Sheets 4 & 5 ✓

21-38 Annexure hereto

If space is insufficient, add annexure sheet(s)

Ref:penrith /Src:M

BT 4992 K 13

Req:R725586 /Doc:PA 053286 PA /Rev:22-Jun-2015 /Sts:OK.SC /Pgs:ALL /Prt:08-Nov-2016 09:19 /Seq:4 of 5

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R725586 /Doc:PA 053286 PA /Rev:22-Jun-2015 /Sts:OK.SC /Pgs:ALL /Prt:08-Nov-2016 09:19 /Seq:3 of 5
Ref:penrith /Src:M

SECOND SCHEDULE (Continued)

No.	Date	Nature of Document	Parties	Registration Book	Registration No.	OFFICE USE By whom Produced
21	6.3.1967	Conveyance	Geoffrey Howard Upton and George Alwyn Power	2839	396	
22	29.3.1967	Reconveyance	Lilian Rose Wright, Harry John Baker and Geoffrey Howard Upton (Re Mortgage Book 2717 No. 92)	2839	394	
23	29.3.1967	Mortgage	George Alwyn Power and Geoffrey Howard Upton	2839	397	See Sheet 4 & 5.
24	30.3.1967	Lease	George Alwyn Power and Caltex Oil (Australia) Pty. Limited	2841	438	16/12
25	30.3.1967	Sub-Lease	Caltex Oil (Australia) Pty. Limited and George Alwyn Power	2841	439	
26	30.3.1967	Deed of Consent	Geoffrey Howard Upton, George Alwyn Power and Caltex Oil (Australia) Pty. Limited	2842	565	
26A	3.8.1972	Option to Purchase				
27	16.8.1972	Nomination and notice	Norrie Hennessy, Justin Jones and Galvina Pty. Limited	3069	302	
28	19.9.1972	Survey	Donald P. Rich			
29	15.12.1972	Survey	Donald P. Rich			
30	26.2.1973	Deed of Covenant	Geoffrey Howard Upton, Zenda Merle Upton, Mark Howard Upton and Galvina Pty. Limited	3284	370	
31	28.2.1973	Discharge of Mortgage	Geoffrey Howard Upton and George Alwyn Power (endorsed on Mortgage Book 2839 No. 397)	3084	904	
32	28.2.1973	Conveyance	George Alwyn Power and Galvina Pty. Limited	3084	905	
33	28.2.1973	Surrender of Lease	Caltex Oil (Australia) Pty. Limited and Galvina Pty. Limited (Re Lease Book 2841 No. 438)	3090	208	See Sheet 4 & 5 16/12
34	2.11.1973	Mortgage	Galvina Pty. Limited, James Wallace (Holdings) Limited and Patrick-Intermarine (Australia) Limited	3122	850	
35	19.7.1977	Statutory Declaration	Elizabeth Lamboo			
36	20.7.1977	Discharge of Mortgage	Intermarine Australia Limited and Galvina Pty. Limited (endorsed on Mortgage Book 3122 No. 850)	3284	92	
37	21.7.1977	Conveyance	Galvina Pty. Limited and Altco Holdings Pty. Limited	3284	90	
38	23.9.1977	Mortgage	Altco Holdings Pty. Limited and Mercantile Pacific Finance Limited	3292	176	
39.	10-10-77	Authority	Altco Holdings P/L to G. Thorne			
40.	———	Official Search copy	Registrar General's Letter re Title Diagram			
			Received Documents 39 & 40. See Sheet 2 7/11/77			

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R725586 /Doc:PA 053286 PA /Rev:22-Jun-2015 /Sts:OK.SC /Pgs:ALL /Prt:08-Nov-2016 09:19 /Seq:5 of 5
Ref:penrith /Src:M

53286

DEPARTMENTAL USE ONLY	TO BE COMPLETED BY LODGING PARTY
PRIMARY APPLICATION 53286 DP593084	Lodged by HUNT - HUNT Address: C.D.E. No. Phone No.:

Area 1102 m².

DEPARTMENTAL USE ONLY

NOTES

Documents to be scheduled

Where an applicant claims an estate in fee simple by virtue of a documentary title the Second Schedule should commence with a good root of title at least thirty years old or with a later deed which has already been accepted by the Registrar General in an earlier application. Clause 8 of the declaration should be suitably amended.

Where the applicant claims title by possession the devolution of the documentary title of the person(s) against whom possession is asserted should be shown in the Second Schedule.

Where the applicant claims the benefit of an appurtenant easement the Second Schedule should contain a reference to:

* the deed by which the grantor of the easement acquired title to the servient tenement, and
* the deed by which the easement was created.

The applicant will be required to establish (e.g. by searches) that the easement has not been determined by surrender, union of tenements or otherwise.

Documents to be lodged

Upon lodgment the application should be accompanied by:

* all deeds and other documents evidencing the devolution of title from the abovementioned commencing point;

  Deeds and other documents which relate to the period prior to the selected commencing point should not be scheduled in or lodged with this application but should be retained in case the Examiner of Titles should require their subsequent production.
* any abstract(s) of title in the applicant's possession covering the relevant period; and
* searches showing the result of searches in the general register of deeds, the register of causes, writs and orders, the register of resumptions and the bankruptcy registers.

Searches

The searches obtained when the applicant or a predecessor in title acquired the land in the application will suffice provided that they commence with a good root of title at least thirty years old or with a later deed already accepted by the Registrar General in an earlier application and, in either case, have been brought up to date or to a recent date. In the case of an application based on possession the searches should show not only the devolution of the documentary title (which in most cases will need to be traced from the Crown grant) but also the result of searches against the applicant and his predecessors in possession.

Applications based upon possession

There is available upon request at the Examiners Branch a departmental circular containing directions for the guidance of applicants who claim title by possession.

Destruction of documents lodged with the application

Upon the issue of the certificate of title the Registrar General will as a general rule destroy those documents which exclusively affect the land in the application (and which accordingly will be totally cancelled pursuant to Section 29 (2), Real Property Act, 1900). However, documents which would otherwise be destroyed may be returned upon request to interested persons. The request (in writing) should specify the documents to be returned and should be made before the processing of the application has been completed.

ST 4932 K 1877 D. WEST, GOVERNMENT PRINTER

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R725588 /Doc:CT 13759-102 CT /Rev:10-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:08-Nov-2016 09:19 /Seq:1 of 2
Ref:penrith /Src:MTE OF

NEW SOUTH WALES

CROWN GRANT

No. 61127

FREE

Vol 13759 Fol 102
Registered 20-12-1978

CANCELLED

Registrar General

(Page 1) Vol. 13759 Fol. 102

We, Elizabeth the Second, by the Grace of God Queen of Australia and Her other Realms and Territories, Head of the Commonwealth, do hereby grant to the person described in the First Schedule an Estate in Fee Simple in the land within described, subject nevertheless to such reservations, conditions and other provisions as are shown in the Second Schedule. In testimony whereof We have caused this Our Grant to be sealed with the seal of Our said State

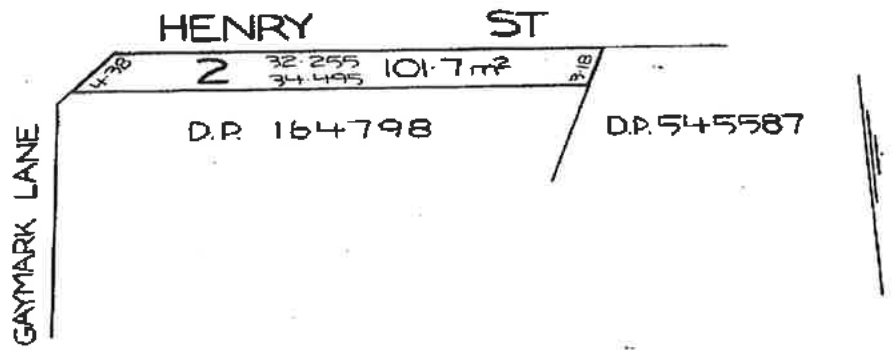
Witness Our Governor of Our State of New South Wales and its Dependencies in the Commonwealth of Australia, at Sydney in Our said State, this eleventh day of December in the twenty seventh year of Our Reign and in the year of Our Lord one thousand nine hundred and seventy eight.

A. R. Cutler

Governor

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



REDUCTION RATIO 1:400

LAND REFERRED TO

Lot 2 in Deposited Plan 254763 in the City of Penrith Parish of Castlereagh and County of Cumberland. EXCEPTING THEREOUT the land below a depth of 20 metres from the surface.

FIRST SCHEDULE

ALLEN HOLDINGS (AUSTRALIA) PTY. LTD.

SECOND SCHEDULE

1. We do hereby reserve and except unto Us Our Heirs and Successors all minerals which the land hereby granted contains with full power and authority for Us Our Heirs and Successors and such person or persons as shall from time to time be authorised by Us or Them to enter upon the land hereby granted and to search for mine dig and remove the said minerals and also all such parts and so much of the land hereby granted as may hereafter be required for public ways in over and through the same to be set out by Our Governor for the time being of Our said State or some person by him authorised in that respect with full power for Us Our Heirs and Successors and for Our Governor as aforesaid by such person or persons as shall be by Us Them or him authorised in that behalf to make and conduct all such public ways And the right of full and free ingress egress and regress into out of and upon the land hereby granted for the several purposes aforesaid or any of them Provided Further and it is expressly declared that mining operations may have been and may be carried on upon and in the land below the land hereby granted and the lands adjoining the land hereby granted and the land below the same and metals and minerals may have been and may be removed therefrom and that these presents are made upon and subject to the condition that neither the Grantee or Grantees nor his her their or its sequels in title shall be entitled to make or prosecute any claim for damages or take any proceedings either by way of injunction or otherwise against Us Our Heirs and Successors or the Government of Our said State or any lessee or lessees under any Mining Act or Acts of Our said State or his or their executors administrators or assigns for or in respect of any damage or loss occasioned by the letting down subsidence or lateral movement of the land hereby granted or otherwise howsoever by reason of the following acts and matters that is to say by reason of Us Our Heirs or Successors or the Government of Our said State or any person on Our Their or its behalf or any lessee or lessees as aforesaid or his or their executors administrators or assigns having worked or now or hereafter working any mines or having carried on or now or hereafter carrying on mining operations or having searched for worked won or removed or now or hereafter searching for working winning or removing any metals or minerals under in or from the land below the land hereby granted or on in under or from any other lands situated laterally to the land hereby granted and the land below the same and whether on or below the surface of such other lands Provided Lastly and we do hereby expressly reserve unto Us Our Heirs and Successors the liberty and authority by reason of the acts and matters aforesaid or in the course thereof for Us Our Heirs and Successors and the Government of Our said State and any person on Our Their or its behalf and any lessee or lessees as aforesaid and his or their executors administrators and assigns to from time to time let down without payment of any compensation whatsoever any part of the land hereby granted and/or of the surface thereof.

~~2. Restrictions as to dealings see section~~

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE REGISTRAR GENERAL'S OFFICE

RG 2/124 NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

R 59835 Lot 2 DP 113118

(Page 2 of 2 pages)

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	REGISTERED	Signature of Registrar General
NEW CERTIFICATE(S) OF TITLE ISSUING ON DP113118 NO DEALING TO BE REGISTERED WITHOUT REFERENCE TO SURVEY DRAFTING BRANCH.				
This deed is cancelled as to the whole.				
New Certificates of Title have issued on 12-3-1979				
for lots in Deposited Plan No. 113118 as follows:-				
Lots 1 Vol 13820 Fol 105 respectively.				
Consolidation Vide RPA 53286.				
REGISTRAR GENERAL				

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION	

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Vol. 13759 Fol. 102

Req:R725588 /Doc:CT 13759-102 CT /Rev:10-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:08-Nov-2016 09:19 /Seq:2 of 2
Ref:penrith /Src:M

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R725537 /Doc:CT 13820-105 CT /Rev:13-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:08-Nov-2016 09:16 /Seq:1 of 2
Ref:penrith /Src:M

[redacted]ICATE OF TITLE

NEW SOUTH WALES

[redacted] PROPERTY ACT, 1900

Vol. 13820 Fol. 105

Appln. No.53286 (part)

Prior Title Vol.13759 Fol.102 (part)

EDITION ISSUED

5 3 1979

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

CANCELLED

SEE AUTO FOLIO

Registrar General.

(Page 1) Vol. 13820 Fol. 105

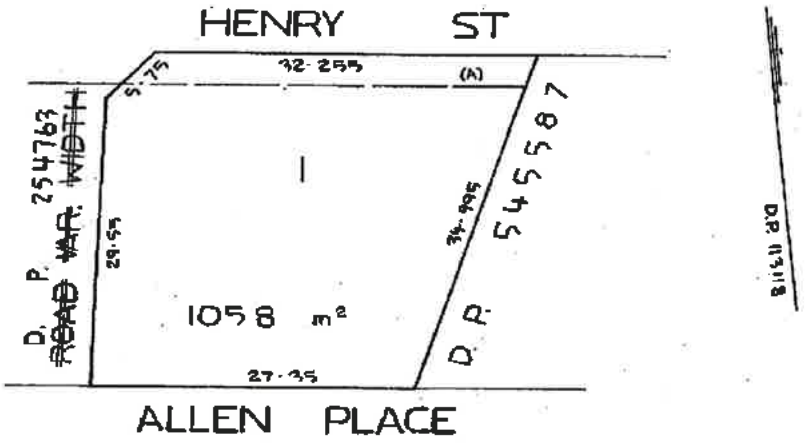
1979M7

Reg. Gen.

14-12-1979

PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



(A) EXCEPTIONS BY CROWN GRANT

P.A. 53286

REDUCTION RATIO 1:500

1979M7

Reg. Gen.

29-7-1979

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 1 in Deposited Plan 113118 in the City of ~~Parramatta~~ Penrith Parish of Castlereagh and County of Cumberland being part of Portion 90 granted to Daniel Woodriff on 1-2-1804 and lot 2 in Deposited Plan 254763 granted by Crown Grant Volume 13759 Folio 102. EXCEPTING THEREOUT all minerals and land below a depth of 20 metres from the surface as regards the part shown so burdened in the plan hereon reserved by the Crown Grant.

FIRST SCHEDULE

~~ALLEN HOLDINGS (AUSTRALIA) PTY. LIMITED.~~

GRY

SECOND SCHEDULE

1. Reservations and conditions, if any, contained in the Crown Grants above referred to.
2. Book 3303 No.214 Lease dated 29-11-1977 for a term of 15 years from 1-12-1977 of part of the land above described.

PERSONS ARE CAUTIONED AGAINST ALTERING OR ADDING TO THIS CERTIFICATE OR ANY NOTIFICATION HEREON

WARNING: THIS DOCUMENT MUST NOT BE REMOVED FROM THE REGISTRAR GENERAL'S OFFICE.

RG 2/62 NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Vol. 13320 Fol. 105

FIRST SCHEDULE (continued)

REGISTERED PROPRIETOR	INSTRUMENT NATURE	INSTRUMENT NUMBER	REGISTERED	Signature of Registrar General
~~OPP Nominees Pty. Limited~~	Transfer	R59855	~~6-3-1980~~	
Alfred Moss Investments Pty. Limited by Transfers X106782 AND X106783. Registered 6-10-1987.				

CANCELLED

SEE AUTO FOLIO

0503446 P
Q847295 P
R44702
R59855
RESEN 3SB
4970417 (169)
W347327 T/L
X89393 R
X106783
3T

SECOND SCHEDULE (continued)

INSTRUMENT NATURE	INSTRUMENT NUMBER	PARTICULARS	REGISTERED	Signature of Registrar General	CANCELLATION	
~~Mortgage~~	~~0503446~~	~~to The Mercantile Mutual Insurance Company Limited as regards the part of the land within described comprised in Primary Application No. 53286~~	~~5-3-1979~~		Discharged	R44703
~~Mortgage~~	~~Q847295~~	~~to Mercantile Pacific Finance Limited as regards the part of the land within described comprised in Primary Application No. 53286~~	~~5-3-1979~~		Discharged	R44702
(AA) ~~BK 3303 No. 214~~	~~Lease W347327 Transfer Lessee now Rympack Pty Limited. Registered 23-6-1986.~~					
~~X89393 Caveat by Tanjil Court Pty Limited~~		Registered 11.9.1987			Lapsed	X106783

(Page 2 of 2 pages)

NOTE: ENTRIES RULED THROUGH AND AUTHENTICATED BY THE SEAL OF THE REGISTRAR GENERAL ARE CANCELLED

Req:R725537 /Doc:CT 13820-105 CT /Rev:13-Jan-2011 /Sts:OK.SC /Pgs:ALL /Prt:08-Nov-2016 09:16 /Seq:2 of 2
Ref:penrith /Src:M
Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Historical Title

Information Provided Through
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Ph. 02 9231 4872 Fax. 02 9233 6557

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
8/11/2016 9:16AM

FOLIO: 1/113118

First Title(s): SEE PRIOR TITLE(S)
Prior Title(s): VOL 13820 FOL 105

Recorded	Number	Type of Instrument	C.T. Issue
21/8/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
7/3/1989		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
21/6/1993	I379062	LEASE	EDITION 1
21/11/1995	O679591	REQUEST	
21/11/1995	O679592	LEASE	EDITION 2
5/8/1999	6070407	TRANSFER OF LEASE	
18/1/2000	6496147	TRANSFER OF LEASE	
8/8/2000	7007242	DEPARTMENTAL DEALING	EDITION 3
10/12/2001	7961765	SURRENDER OF LEASE	
10/12/2001	7961766	LEASE	EDITION 4
4/3/2003	9421724	TRANSFER OF LEASE	EDITION 5
11/11/2004	AB89213	LEASE	EDITION 6
18/10/2006	AC675587	TRANSFER	EDITION 7
8/4/2010	AF417639	LEASE	EDITION 8
12/4/2013	AH662213	LEASE	EDITION 9
28/5/2015	AJ526509	SURRENDER OF LEASE	
28/5/2015	AJ526510	LEASE	EDITION 10

*** END OF SEARCH ***

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Version: 1, Version Date: 14/04/2021

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Title Search

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/113118

SEARCH DATE	TIME	EDITION NO	DATE
8/11/2016	9:15 AM	10	28/5/2015

LAND

LOT 1 IN DEPOSITED PLAN 113118
LOCAL GOVERNMENT AREA PENRITH
PARISH OF CASTLEREAGH COUNTY OF CUMBERLAND
TITLE DIAGRAM DP113118

FIRST SCHEDULE

PENRITH CITY COUNCIL (T AC675587)

SECOND SCHEDULE (3 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 LAND EXCLUDES MINERALS & LAND BELOW A DEPTH FROM THE SURFACE OF 20 METRES AS REGARDS THE LAND DESIGNATED (A) IN THE TITLE DIAGRAM RESERVED BY THE CROWN GRANT
3 AJ526510 LEASE TO SPECIALTY FASHION GROUP LIMITED OF 118 HENRY STREET, PENRITH. EXPIRES: 31/7/2019. OPTION OF RENEWAL: 5 YEARS.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register. InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act 1900.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

scottASHWOOD PTY.LTD
An InfoTrack Company

ABN: 42 166 543 255
Ph: 02 9099 7400
Fax: 02 9232 7141
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Summary of Owners Report

LPI **Sydney**

Address: 42 – 44 Station Street, Penrith

Description: - Lot 3 D.P. 1200790

Date of Acquisition and term held	Registered Proprietor(s) & Occupations where available	Reference to Title at Acquisition and sale
1.6.1881 (1881 to 1927)	Francis Henry Woodriff (Gentleman)	Book 222 No. 132
23.6.1927 & 22.12.1927 (1927 to 1949)	Nelson Price (Undertaker)	Book 1476 No. 306 & Book 1498 No. 679
15.9.1949 (1949 to 1950)	Rural Bank of New South Wales	Book 2098 No. 394
11.5.1950 (1950 to 1973)	William Frederick Smith (Hire Car Proprietor)	Book 2125 No. 665
7.2.1973 (1973 to 2013)	G.B. & H. Lynch Pty Limited Now G.B. & J.A. Lynch Pty Limited	Book 3084 No. 154 Now C/158845
23.9.2013 (2013 to Date)	# Penrith City Council	C/158845 Now 3/1200790

# Denotes Current Registered Proprietors

Easements: -NIL

Leases: -
3.6.2015 AI898783 – Donna Hildon & Belinda Jain Erich

Yours Sincerely
James McDonnell
8 October 2016

Email: james.mcdonnell@scottashwood.com

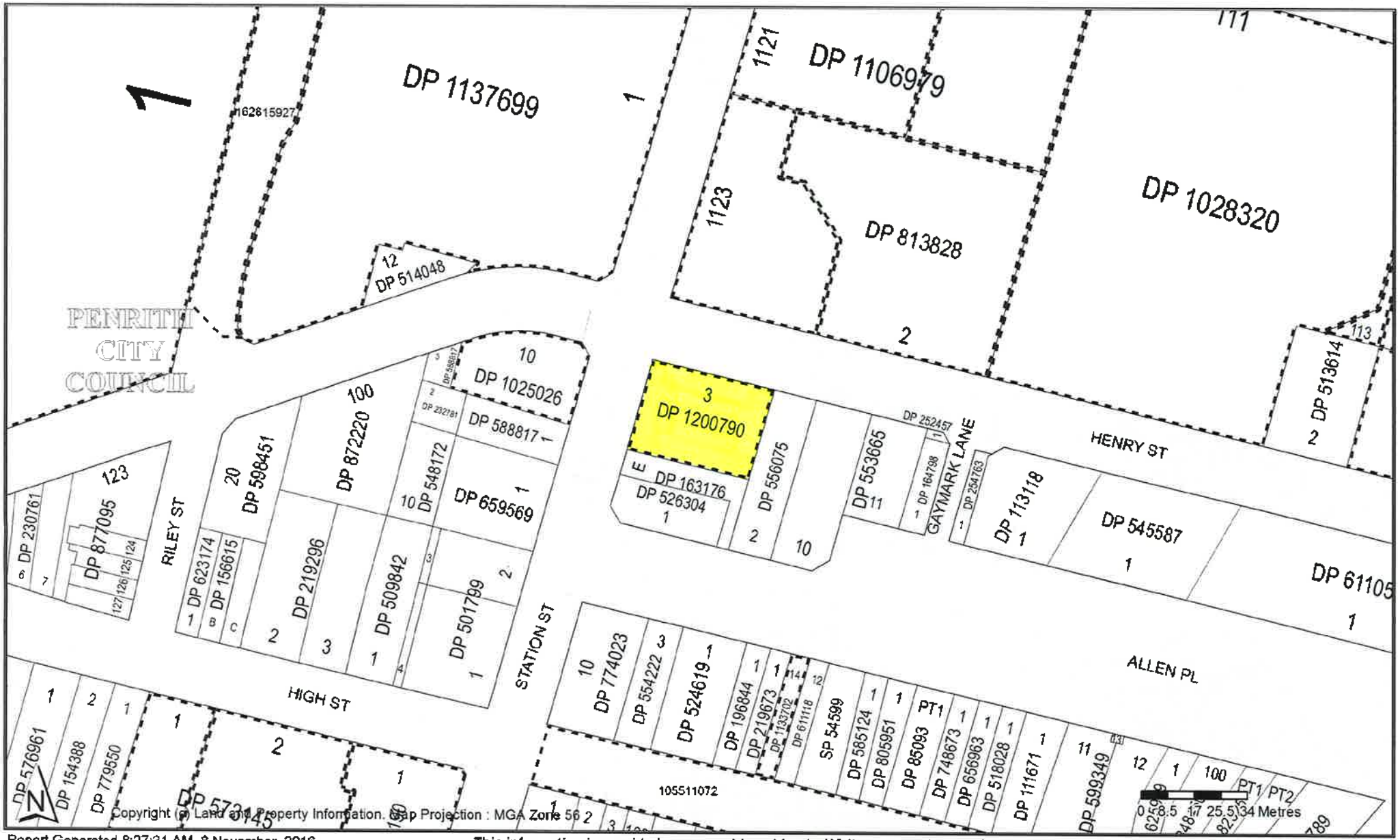
Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Land & Property Information

Cadastral Records Enquiry Report

Requested Parcel : Lot 3 DP 1200790 **Identified Parcel** : Lot 3 DP 1200790

Locality : PENRITH **LGA** : PENRITH **Parish** : CASTLEREAGH **County** : CUMBERLAND



Report Generated 8:27:31 AM, 8 November, 2016

Copyright © Land and Property Information ABN: 84 104 377 806

This information is provided as a searching aid only. While every endeavour is made to ensure the current cadastral pattern is accurately reflected, the Registrar General cannot guarantee the information provided. For all ACTIVITY PRIOR to SEPT 2002 you must refer to the RGs Charting and Reference Maps.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

	Status	Surv/Comp	Purpose
DP1200790			
Lot(s): 3			
DP158845	HISTORICAL	SURVEY	UNRESEARCHED

Road

Polygon Id(s): 105511072

EX-SUR 59/14 DP980943

Polygon Id(s): 162815927

NSW GAZ. 21-10-2005 Folio : 8879

CLOSED ROAD

LOTS 34-37 IN DP1085231 - STRATUM LOTS

CA94915 - LOTS 34-37 DP1085231

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R725221 /Doc:DP 1200790 P /Rev:01-May-2015 /Sts:SC.OK /Pgs:ALL /Prt:08-Nov-2016 08:52 /Seq:1 of 3
Ref:penrith /Src:M

PLAN FORM 2 (A2)

WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION

ePlan

Sheet 1 of 1 sheets

SURVEYING & SPATIAL INFORMATION REGULATION 2012 CLAUSE 6(1)(d)

MARK	M.G.A. CO-ORDINATES (ZONE 56) EASTING	NORTHING	CLASS	ORDER	METHOD
PM12560	286 153 765	6 262 923 854	B	2	SCIMS
PM12564	286 309 844	6 262 916 951	B	2	SCIMS
PM19111	286 232 259	6 262 696 699	B	2	SCIMS

COMBINED SCALE LEVEL AND SCALE FACTOR 1.000195

SOURCE M.G.A. CO-ORDINATES ACCEPTED FOR ESTABLISHED MARKS FROM SCIMS JANUARY 2014

0	10	20	30	40	50	60	70	80	90	100	110	120	130	140

M.G.A. NORTH

PM12560 FD

PM19111 FD

PM12564 FD

STATION

ALLEN PLACE

HENRY STREET

GAYMARK LANE

STREET

3

1184m²

DIAGRAM ONE NOT TO SCALE

DIAGRAM TWO NOT TO SCALE

Surveyor: Peter Robert Warnock
Ph 47213253 email: pwarnock@mercurynet.com.au
Date of Survey: 3rd June 2014
Surveyor's Reference: 16546-C

PLAN OF DELIMITATION OF LOT C D.P. 156845

LGA: PENRITH
Locality: PENRITH
Subdivision No.: ——
Lengths are in metres. Reduction Ratio 1:400

Registered: 1.5.2015

D.P.1200790

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PLAN FORM 6(2012) WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION ePlan

DEPOSITED PLAN ADMINISTRATION SHEET

Registered: 1.5.2015 Office Use Only

Title System: TORRENS

Purpose: DELIMITATION

Office Use Only

DP1200790

PLAN OF DELIMITATION OF
LOT C D.P.158845

L G A: PENRITH

Locality: PENRITH

Parish: CASTLEREAGH

County: CUMBERLAND

Crown Lands NSW/Western Lands Office Approval

I, ...in approving this plan certify
Authorised Officer
that all necessary approvals in regard to the allocation of the land shown hereon have been given.

Signature .....

Date:.....

File No: .....

Office:.....

Subdivision Certificate

I .....

*Authorised Person/General Manager/Accredited Certifier, certify that the provisions of s.109J of the Environmental Planning and Assessment Act, 1979 have been satisfied in relation to the proposed subdivision, new road or reserve set out herein

Signature: .....

Accreditation No. .....

Consent Authority .....

Date of endorsement .....

Subdivision Certificate No. .....

File No. .....

* strike through if inapplicable

Survey Certificate

I, PETER ROBERT WARWICK
of VINCE MORGAN SURVEYORS PTY.LTD.
Ph.47215293, email: pwarwick@vmsurvey.com.au
a surveyor registered under the Surveying & Spatial Information Act, 2002 certify that:

(a) The land shown in the plan was surveyed in accordance with the Surveying and Spatial Information Regulation, 2012, is accurate and the survey was completed on 3rd June, 2014.

~~*(b) The part of the land shown in the plan being.....*~~
~~.....~~
was surveyed in accordance with the Surveying and Spatial Information Regulation, 2012, is accurate and the survey was completed on ..... the part not surveyed was compiled in accordance with that Regulation.

~~*(c) The land shown in the plan was compiled in accordance with the Surveying and Spatial Information Regulation, 2012.*~~

Signature: Dated: 3rd June, 2014.

Surveyor ID: 2207

Datum Line: ('X'-'Y') PM12654 TO PM41911

Type: URBAN

The terrain is level–undulating

Statements of intention to dedicate public roads, public reserves and drainage reserves.

Plans used:–
D.P.158845
D.P.163176
D.P.526304
D.P.545587
D.P.553665
D.P.556075
D.P.1106979

Signatures, Seals and Section 88B Statements should appear on PLAN FORM 6A

SURVEYOR'S REFERENCE: 18538-C

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 2 of 2 sheets

Office Use Only

Registered: 1.5.2015

Office Use Only

DP1200790

PLAN OF DELIMITATION OF
LOT C D.P.158845

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses – See 60(c) SSI Regulation 2012
- Statements of intention to create and release affecting interests in accordance with section 88B Conveyancing Act, 1919.
- Signatures and seals – See 195D Conveyancing Act, 1919.
- Any information which cannot fit in the appropriate panel of sheet 1 of the Administration sheets.

Subdivision Certificate No.: ———

Date of Endorsement: ———

Signed by the General Manager, Alan Stoneham

For and on behalf of Penrith City Council

SCHEDULE OF STREET ADDRESSES

LOT No.	STREET No.	STREET NAME	STREET TYPE	LOCALITY
3	42-44	STATION	STREET	PENRITH

SURVEYOR'S REFERENCE: 18538-C

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
8/11/2016 8:33AM

FOLIO: C/158845

First Title(s): OLD SYSTEM
Prior Title(s): CA71725

Recorded	Number	Type of Instrument	C.T. Issue
4/6/1997	CA71725	CONVERSION ACTION	FOLIO CREATED EDITION 1
9/3/1999	5664435	DEPARTMENTAL DEALING	
1/3/2004	AA459458	DISCHARGE OF MORTGAGE	
1/3/2004	AA459459	DISCHARGE OF MORTGAGE	
1/3/2004	AA459460	MORTGAGE	EDITION 2
7/4/2006	AC229883	DISCHARGE OF MORTGAGE	
7/4/2006	AC229884	MORTGAGE	EDITION 3
24/6/2008	AE41025	DISCHARGE OF MORTGAGE	
24/6/2008	AE41026	MORTGAGE	EDITION 4
10/9/2013	AI5417	CAVEAT	
23/9/2013	AI37302	DISCHARGE OF MORTGAGE	
23/9/2013	AI37303	WITHDRAWAL OF CAVEAT	
23/9/2013	AI37304	TRANSFER	EDITION 5
1/5/2015	DP1200790	DEPOSITED PLAN	FOLIO CANCELLED

*** END OF SEARCH ***

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Req:R730905 /Doc:DL AI037304 /Rev:26-Sep-2013 /Sts:NO.OK /Pgs:ALL /Prt:08-Nov-2016 14:53 /Seq:1 of 1
Ref:penrith /Src:M

Form: 01T
Release: 6·1

TRANSFER

New South Wales
Real Property Act 1900

AI37304U

PRIVACY NOTE: Section 31B of the Real Property Act 1900 (RP Act) authorises the Registrar General to collect the information required by this form for the establishment and maintenance of the Real Property Act Register. Section 96B RP Act requires that the Register is made available to any person for search upon payment of a fee, if any.

STAMP DUTY Office of State Revenue use only

Office of State Revenue
NSW Treasury
Client No: 100390637 2360
Duty: Exempt Trans No: 5277
Asst details: 7240128

(A) **TORRENS TITLE** Folio Identifer C/158845

(B) **LODGED BY**

Document Collection Box	Name, Address or DX, Telephone, and Customer Account Number if any	CODES
1W	Penrith City Council. ~~DX 8017~~ 601 High Street Penrith 2750 Reference: S. Britten 4732 7659	T TW

(C) **TRANSFEROR** G.B. & J.A. Lynch Pty. Limited ACN 001 029 778

(D) **CONSIDERATION** The transferor acknowledges receipt of the consideration of $ 1,980,000.00 and as regards

(E) **ESTATE** the abovementioned land transfers to the transferee an estate in fee simple

(F) **SHARE TRANSFERRED**

(G) Encumbrances (if applicable):

(H) **TRANSFEREE** Penrith City Council

(I) **TENANCY:**

DATE ~~18~~ 19 September 2013

(J) Certified correct for the purposes of the Real Property Act 1900 by the company named below the common seal of which was affixed pursuant to the authority specified and in the presence of the authorised person(s) whose signature(s) appear(s) below.

Complete ▾ Company: G.B. & J.A. LYNCH PTY LTD T/A JOHN PRICE & SON
▾ Authority: JOHN by s.127 DIANE Lynch

Signature of authorised person: ▾ John Lynch
Name of authorised person: ▾ JOHN LYNCH
Office held: ▾ DIRECTOR

Signature of authorised person: ▾ D. Lynch
Name of authorised person: ▾ DIANE LYNCH
Office held: ▾ DIRECTOR

L. Gee
LEN GEE

Certified correct for the purposes of the Real Property Act 1900 on behalf of the transferee by the person whose signature appears below.

Signature: S. Britten

Signatory's name: Stephen Britten
Signatory's capacity: solicitor

(K) The transferee certifies that the eNOS data relevant to this dealing has been submitted and stored under eNOS ID No. 476320 Full name: ~~Sharon Monsegnaur~~ ANDREW AVERY Signature:

* *s117 RP Act requires that you must have known the signatory for more than 12 months or have sighted identifying documentation.*

ALL HANDWRITING MUST BE IN BLOCK CAPITALS

1303

Document Set ID: 9547379
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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - HISTORICAL SEARCH

SEARCH DATE
8/11/2016 8:33AM

FOLIO: 3/1200790

First Title(s): OLD SYSTEM
Prior Title(s): C/158845

Recorded	Number	Type of Instrument	C.T. Issue
1/5/2015	DP1200790	DEPOSITED PLAN	FOLIO CREATED CT NOT ISSUED
3/6/2015	AI898783	LEASE	EDITION 1

*** END OF SEARCH ***

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LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 3/1200790

SEARCH DATE	TIME	EDITION NO	DATE
8/11/2016	8:51 AM	1	3/6/2015

LAND

LOT 3 IN DEPOSITED PLAN 1200790
AT PENRITH
LOCAL GOVERNMENT AREA PENRITH
PARISH OF CASTLEREAGH COUNTY OF CUMBERLAND
TITLE DIAGRAM DP1200790

FIRST SCHEDULE

PENRITH CITY COUNCIL

SECOND SCHEDULE (2 NOTIFICATIONS)

1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
2 AI898783 LEASE TO DONNA HILDON & BELINDA JAIN ERICH EXPIRES: 31/7/2016.

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

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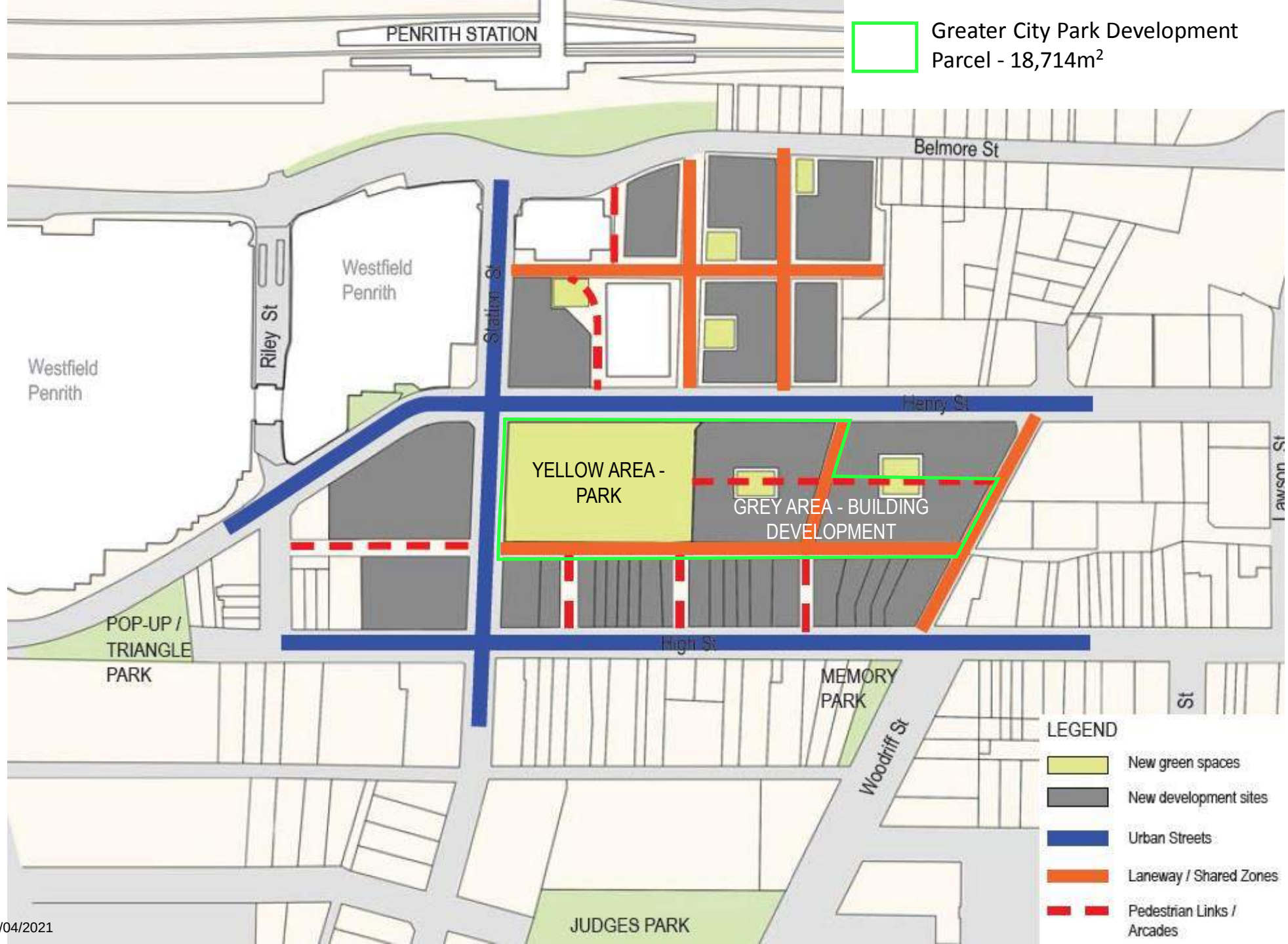
Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix J Proposed General Development Scheme

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix K Calibration and Decontamination Records

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Gas Calibration Certificate

Instrument MX6
Serial No. 13061JT-014
Sensors O2, LEL, CO2

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments			
Battery	Charge Condition	✓				
	Fuses	✓				
	Capacity	✓				
	Recharge OK?	✓				
Switch/keypad	Operation	✓				
Display	Intensity	✓				
	Operation (segments)	✓				
Grill Filter	Condition	✓				
	Seal	✓				
Pump	Operation					
	Filter					
	Flow					
	Valves, Diaphragm					
PCB	Condition	✓				
Connectors	Condition	✓				
			Low	**High**	**TWA**	**STEL**
Sensor	O2	✓	19.5%	23.5%	N/A	N/A
	PID	✓	50ppm	100ppm	10ppm	25ppm
	CO2	✓	0.5%	1.0%	0.5%	3.0%
Alarms	Beeper	✓				
	Settings	✓				
Software	Version	✓				
Datalogger	Operation	✓				
Download	Operation	✓				
Other tests:						

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No	Instrument Reading
O2		20.9% Vol O2		Fresh Air	20.9% O2
PID		98ppm Isobutylene	NATA	SY137	98.6ppm
CO2		0.25%CO2	NATA	SY53	0.28% CO2

Calibrated by: **Sophie Boler**

Calibration date: **1/05/2017**

Next calibration due: **28/10/2017**

Field Equipment Calibration and Decontamination

JBS&G

PROJECT NAME: Penrith	PROJECT NO: 52372
FIELD DATES: 06/05/17 / 07/05/17	FIELD STAFF: SG

CALIBRATION SUMMARY
EQUIPMENT: PID
CALIBRATION STANDARD: Isobutylene 100 PPM

DATE	TIME	READING (ppm_v)	COMMENTS
6/7/17	7:00am	0 PPM	Cal successful
		100 PPM	Cal successful
7/7/17	7:00am	0 PPM	Cal successful
		99 PPM	Cal successful

DECONTAMINATION SUMMARY

EQUIPMENT: soil collected from disposable push tubes.

1. Was the equipment decontaminated appropriately prior to sampling at each location?	Y	N	(NA)
2. Was excess soil removed by scraping, brushing or wiping with disposable towels?	Y	N	(NA)
3. Was the equipment contaminated with grease, tar or similar material?	Y	(N)	NA
If so, was the equipment steam cleaned or rinsed with pesticide-grade acetone:hexane?	Y	N	
4. Was phosphate-free detergent used to wash the equipment?	Y	N	(NA)
5. Was the equipment rinsed with clean water?	Y	N	(NA)
6. Was the equipment then rinsed with deionised water?	Y	N	(NA)
7. Were all sample containers cleaned and acid or solvent washed prior to sample collection?	Y	N	(NA)

WERE ANY ADDITIONAL DECONTAMINATION MEASURES REQUIRED? PROVIDE DETAILS.

fresh nitrile gloves were used for each sample collection

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Field Equipment Calibration and Decontamination

JBS&G

PROJECT NAME: PCC	**PROJECT NO:** 52372
FIELD DATES: 26.5.17	**FIELD STAFF:** AH / AH

CALIBRATION SUMMARY
EQUIPMENT: WQM / PID
CALIBRATION STANDARD: Airmet calibration / Isobutylene 100

DATE	TIME	READING (ppm$_v$)	COMMENTS
26.5.17	7:26	100.1	Calibration OK

DECONTAMINATION SUMMARY

EQUIPMENT: IP & HA

1. Was the equipment decontaminated appropriately prior to sampling at each location?	(Y)	N	NA
2. Was excess soil removed by scraping, brushing or wiping with disposable towels?	(Y)	N	NA
3. Was the equipment contaminated with grease, tar or similar material? If so, was the equipment steam cleaned or rinsed with pesticide-grade acetone:hexane?	Y Y	N N	(NA)
4. Was phosphate-free detergent used to wash the equipment?	(Y)	N	NA
5. Was the equipment rinsed with clean water?	(Y)	N	NA
6. Was the equipment then rinsed with deionised water?	(Y)	N	NA
7. Were all sample containers cleaned and acid or solvent washed prior to sample collection?	(Y)	N	NA

WERE ANY ADDITIONAL DECONTAMINATION MEASURES REQUIRED? PROVIDE DETAILS.

Fresh pair of nitrile gloves used to handle each sample

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Multi Parameter Water Meter

Instrument YSI Quatro Pro Plus
Serial No. 11C100764

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper	✓	
	Settings	✓	
Software	Version	✓	
Data logger	Operation	✓	
Download	Operation	✓	
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 10.00		pH 10.00		291176	pH 9.20
2. pH 7.00		pH 7.00		290453	pH 6.91
3. pH 4.00		pH 4.00		288994	pH 4.03
4. mV		229.6mV		OB1388/OB1390	230.8mV
5. EC		2.76mS		292380	2.76mS
6. D.O		0.00 ppm		4347	0.00ppm
7. Temp		22.5°C		MultiTherm	22.2°C

Calibrated by: **Joanna Wong**

Calibration date: **23/05/2017**

Next calibration due: **19/11/2017**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix L Detailed Laboratory Reports and Chain of Custody Documentation

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

04437

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52372	LABORATORY BATCH NO.:
PROJECT NAME: PENRITH	SAMPLERS: JL
SEND REPORT TO: RHammond@jbsg.com.au SEND INVOICE TO:	PHONE: SYDNEY 02 8245 0300 – PERTH 08 9488 0100 EMAIL:
DATE NEEDED BY:	QC LEVEL: NEPM (2013)

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

TESTING TBA

545235

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	NOTES:
JB10 0.1-0.2	Soil	7-5-17		Jar + Bag		
JB10 0.3-0.4				Jar + Bag		
JB10 0.4-0.5				Jar		
JB10 1.0-1.2				Jar		
JB17 0.1-0.25				Jar + Bag		
JB17 0.25-0.35				Jar		
JB17 1.1-1.2				Jar		
JB07 0.1-0.2				Jar + Bag		
JB07 0.2-0.3				Jar		
JB07 1.1-1.2				Jar		
JB14 0.1-0.3				Jar + Bag		
JB14 0.3-0.4				Jar		
JB14 1.1-1.2				Jar		
JB13 0.1-0.2				Jar + Bag		
JB13 0.2-0.3				Jar		
JB13 1.1-1.2				Jar		
QA20170507-1				Jar + Bag		
JB12 0.1-0.25				Jar + Bag		
JB12 0.25-0.35				Jar		

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: JL DATE: 8-5-17	CONSIGNMENT NOTE NO.	NAME: Rupam DATE: 12:00	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	OF:	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE: 08/05	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO Forms013 – Chain of Custody - Generic

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

04438

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: S2372	LABORATORY BATCH NO.:
PROJECT NAME: PERTH	SAMPLERS: JL
SEND REPORT TO: [illegible]@jbsg.com.au SEND INVOICE TO:	PHONE: SYDNEY 02 8245 0300 – PERTH 08 9488 0100 EMAIL:
DATE NEEDED BY:	QC LEVEL: NEPM (2013)

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

TESTING TBA

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	NOTES:
SB12 1.1-1.2	Soil	7.5.17		Jar		
JB04 0.1-0.2				Jar + Bag		
JB04 0.4-0.5				Jar + Bag		
JB04 0.5-0.6				Jar		
JB04 1.1-1.2				Jar		
JB05 0.1-0.2				Jar + Bag		
JB05 0.5-0.6				Jar + Bag		
JB05 0.6-0.7				Jar		
JB05 1.1-1.2				Jar		
JB03 0.05-0.2				Jar + Bag		
JB03 0.2-0.45				Jar + Bag		
JB03 0.45-0.65				Jar		
JB03 1.1-1.2				Jar		
JB01 0.05-0.3				Jar + Bag		
JB01 0.3-0.4				Jar		
JB01 1.1-1.2				Jar.		
QC20170507-2				Jar + Bag		
JB02 0.05-0.25	↓	↓		Jar + Bag		
JB02 0.25-0.35				Jar		

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: JL DATE: 8-5-17	CONSIGNMENT NOTE NO.	NAME: DATE: 12.30	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	OF: [signature]	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE: 08/05	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO Forms013 – Chain of Custody - Generic

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

04439

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52392	LABORATORY BATCH NO.:
PROJECT NAME: PEARTH	SAMPLERS: JC
SEND REPORT TO: rhaumann@jbs.com.au SEND INVOICE TO:	PHONE: SYDNEY 02 8245 0300 – PERTH 08 9488 0100 EMAIL:
DATE NEEDED BY:	QC LEVEL: NEPM (2013)

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL

TESTING TBA

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	NOTES:
JBS2 1-1-1.2	Soil	7-5-17		Jars.		
RIN 6-5	Water	6-5-17		Metals, Amber, Vials x3		
RIN 7-5	↓	7-5-17		" " "		
TS/SB	↓			x2 vials (each)		

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: JC DATE: 8-5-17 OF: JBS&G	CONSIGNMENT NOTE NO. TRANSPORT CO.	NAME: DATE: OF: Rupam 12:00	COOLER SEAL – Yes..... No ..... Intact ..... Broken ..... COOLER TEMP ..... deg C
NAME: DATE: OF:	CONSIGNMENT NOTE NO. TRANSPORT CO	NAME: DATE: 08/05 OF:	COOLER SEAL – Yes..... No ..... Intact ..... Broken ..... COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody - Generic

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Enviro Sample NSW

From: Nibha Vaidya
Sent: Wednesday, 10 May 2017 11:42 AM
To: Enviro Sample NSW; COC NSW; Rupan Virk
Cc: Matthew Quigley
Subject: RE: 5 DAY TAT - 545235 - FW: Awaiting analysis

Follow Up Flag: Follow up
Flag Status: Flagged

Thanks Ursula,

Log them all as per Rohan's email for now and ask Matt to check the volumes.

Matt – Can you take care of this please? We may have to analyse different samples instead if the sample volumes are low.

Kind Regards,

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

From: Enviro Sample NSW
Sent: Wednesday, 10 May 2017 11:35 AM
To: Nibha Vaidya; COC NSW; Rupan Virk
Cc: Matthew Quigley
Subject: RE: 5 DAY TAT - 545235 - FW: Awaiting analysis

Hi Nibha,
Not all the bags are full so not sure if all can be done.
I'll go through them & let you know what can be.
Do you want me to weigh them?

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Thanks,
Ursula

Enviro Sample NSW
Phone: +61 2 9900 8492
Email : EnviroSampleNSW@Eurofins.com

From: Nibha Vaidya
Sent: Wednesday, 10 May 2017 10:45 AM
To: Enviro Sample NSW; COC NSW; Rupan Virk
Cc: Matthew Quigley
Subject: 5 DAY TAT - 545235 - FW: Awaiting analysis

SR – Please add analysis to report 545235 as per below. Log JB1A as JB1 and AsbWA.

Can you please check to see if there are full 500mL bags for all samples requested for AsbWA?

Kind Regards,

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

From: Rohan Hammond [mailto:RHammond@jbsg.com.au]
Sent: Wednesday, 10 May 2017 10:36 AM
To: Nibha Vaidya
Subject: RE: Awaiting analysis

Hi Nibha,

Please find below the analysis for Penrith. Please note that the asbestos is 500 mL WA analysis, and if any bags do not have su
please let me know and I will move the analysis to another sample.

Regards,

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Sample Name	JB1A	OCP/PCB	VOC	Heavy Metals	BTEX	pH, CEC & % Clay
JB01 0.05-0.3	x					
JB01 0.3-0.4						
JB01 1.1-1.2				x		x
JB02 0.05-0.25				x		
JB02 0.25-0.35						
JB02 1.1-1.2						
JB03 0.05-0.2				x		
JB03 0.2-0.45						
JB03 0.45-0.65						
JB03 1.1-1.2						
JB04 0.1-0.2						
JB04 0.4-0.5	x		x			
JB04 0.5-0.6						
JB04 1.1-1.2						
JB05 0.1-0.2				x		
JB05 0.5-0.6						
JB05 1.1-1.2						
JB06 0.1-0.2	x		x			
JB06 0.4-0.5						
JB07 0.1-0.2			x	x		
JB07 0.2-0.3						
JB07 1.1-1.2						
JB08 0.1-0.2	x					
JB08 0.2-0.3						
JB08 0.6-0.7						
JB09 0.15-0.2				x		
JB09 0.2-0.3						
JB09 0.45-0.55						
JB10 0.1-0.2	x					

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB10 0.3-0.4						
JB10 0.4-0.5						
JB11 0-0.05						
JB11 0.05-0.15	x	x	x			
JB11 0.25-0.35						
JB11 0.35-0.45						x
JB12 0.1-0.25	x		x			
JB12 0.25-0.35						
JB12 1.1-1.2						x
JB13 0.1-0.2				x		
JB13 0.2-0.3						
JB13 1.1-1.2						
JB14 0.1-0.3	x					
JB14 0.2-0.3						
JB14 1.1-1.2						
JB15 0.1-0.2		x		x		
JB15 0.4-0.5						
JB15 0.5-0.6						
JB16 0.05-0.15			x			
JB16 0.35-0.45						
JB17 0.1-0.25	x					
JB17 0.25-0.35						
JB17 1.1-1.2						
JB18 0.1-0.2	x	x	x			
JB18 0.4-0.5						
JB18 0.6-0.7						
JB19 0.1-0.2						
JB19 0.3-0.4			x			
JB19 0.9-1						
JB19 1.6-1.7	x	x	x			
JB19 1.7-1.8				x		

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB20 0.05-0.15						
JB20 0.5-0.6	x					
JB20 1.15-1.25						
JB20 1.25-1.35				x		
JB20 1.5-1.6						
JB20 1.7-1.8	x	x	x			
JB20 1.9-2						x
QC20170506-1	x	x	x			
QC20170506-2				x		
QC20170507-1						
QC20170507-2						
RIN 6-5	x	x	x			
RIN 7-5	x	x	x			
TS/TB					x	

From: Nibha Vaidya [mailto:NibhaVaidya@eurofins.com]
Sent: Tuesday, May 9, 2017 10:26 AM
To: Rohan Hammond <RHammond@jbsg.com.au>; Charl Du Preez <CharlDuPreez@eurofins.com>
Subject: RE: Awaiting analysis

Hi Rohan,

That's no problem, we will merge these two reports.

Thanks!

Kind Regards,

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

From: Rohan Hammond [mailto:RHammond@jbsg.com.au]
Sent: Tuesday, 9 May 2017 8:22 AM
To: Charl Du Preez
Cc: Nibha Vaidya
Subject: Re: Awaiting analysis

Hi all,

just noticed that the Penrith samples have been logged as two separate jobs/reports - 545235 and 525227. Can you samples are from the same sampling batch.

Kind Regards,
Rohan Hammond

Rohan Hammond | Environmental Consultant | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane
Level 1, 50 Margaret Street Sydney NSW 2000
T: 02 8245 0300 | M: 0430 379 445| www.jbsg.com.au
Contaminated Land | Groundwater Remediation | Auditing and Compliance | Assessments and Approvals | Occupational Hygiene and

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From: Charl Du Preez <CharlDuPreez@eurofins.com>
Sent: 09 May 2017 08:08:35
To: Rohan Hammond
Cc: Nibha Vaidya
Subject: RE: Awaiting analysis

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Thanks Rohan

Charl DuPreez

Phone : +61 2 9900 8460

Email : CharlDuPreez@eurofins.com

From: Rohan Hammond [mailto:RHammond@jbsg.com.au]
Sent: Tuesday, May 09, 2017 7:45 AM
To: Charl Du Preez
Cc: Nibha Vaidya
Subject: Re: Awaiting analysis

Hi charl. I am in the office tomorrow and will be forwarding analysis then.

Rohan.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Sent from my Samsung Galaxy smartphone.

-------- Original message --------

From: Charl Du Preez <CharlDuPreez@eurofins.com>

Date: 8/05/2017 6:04 PM (GMT+10:00)

To: Rohan Hammond <RHammond@jbsg.com.au>

Cc: Nibha Vaidya <NibhaVaidya@eurofins.com>

Subject: Awaiting analysis

Rohan – hope you are doing well mate.

Will you be sending through a COC for samples dropped today?

Regards,

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Charl DuPreez
Business Unit Manager – NSW

Eurofins | mgt
Unit F3, Parkview Building
16 Mars Road
LANE COVE WEST NSW 2066
AUSTRALIA
Phone : +61 2 9900 8460
Mobile : +61 488 348 999
Fax : +61 2 9420 2977

Email : CharlDuPreez@eurofins.com

Website : www.eurofins.com.au/environmental-testing

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Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 18217

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Rohan Hammond
Project name: HOLD: PENRITH
Project ID: 52372
COC number: Not provided
Turn around time: 5 Day
Date/Time received: May 8, 2017 12:00 PM
Eurofins | mgt reference: **545235**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 23.5 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Rohan Hammond - rhammond@jbsg.com.au.

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261 Site # 12142

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 545235
Phone: 02 8245 0300
Fax:

Received: May 10, 2017 12:00 PM
Due: May 17, 2017
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract)	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Volatile Organics	Moisture Set	Cation Exchange Capacity	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
External Laboratory																	
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**												
	JB09_0.15-0.20	May 06, 2017		Soil	S17-My07711							X			X		
	JB09_0.2-0.3	May 06, 2017		Soil	S17-My07712			X									
	JB09_0.45-0.55	May 06, 2017		Soil	S17-My07713			X									
	JB08_0.1-0.2	May 06, 2017		Soil	S17-My07714		X	X							X		X
	JB08_0.2-0.3	May 06, 2017		Soil	S17-My07715			X									
	JB08_0.6-0.7	May 06, 2017		Soil	S17-My07716			X									
	JB16_0.05-0.15	May 06, 2017		Soil	S17-My07717									X	X		

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

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Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
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16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 18217

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 545235
Phone: 02 8245 0300
Fax:

Received: May 10, 2017 12:00 PM
Due: May 17, 2017
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract)	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Volatile Organics	Moisture Set	Cation Exchange Capacity	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
8	JB16_0.35-0.45	May 06, 2017		Soil	S17-My07718			X									
9	JB06_0.1-0.2	May 06, 2017		Soil	S17-My07719		X							X	X		X
10	JB06_0.4-0.5	May 06, 2017		Soil	S17-My07720			X									
11	JB15-0.1-0.2	May 06, 2017		Soil	S17-My07721					X	X	X			X		
12	JB15-0.4-0.5	May 06, 2017		Soil	S17-My07722			X									
13	JB15-0.5-0.6	May 06, 2017		Soil	S17-My07723			X									
14	JB18_0.1-0.2	May 06, 2017		Soil	S17-My07724		X			X	X			X	X		X
15	JB18_0.4-0.5	May 06, 2017		Soil	S17-My07725			X									
16	JB18_0.6-0.7	May 06, 2017		Soil	S17-My07726			X									
17	JB19_0.1-0.2	May 06, 2017		Soil	S17-My07727			X									
18	JB19_0.3-0.4	May 06, 2017		Soil	S17-My07728									X	X		

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Site # 18217

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
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NSW 2000

Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 545235
Phone: 02 8245 0300
Fax:

Received: May 10, 2017 12:00 PM
Due: May 17, 2017
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract)	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Volatile Organics	Moisture Set	Cation Exchange Capacity	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
19	JB19_0.9-1.0	May 06, 2017		Soil	S17-My07729			X									
20	JB19_1.6-1.7	May 06, 2017		Soil	S17-My07730		X			X	X			X	X		X
21	JB19_1.8-1.9	May 06, 2017		Soil	S17-My07731			X									
22	JB20_0.05-0.15	May 06, 2017		Soil	S17-My07732			X									
23	JB20_0.5-0.6	May 06, 2017		Soil	S17-My07733		X								X		X
24	JB20_1.15-1.25	May 06, 2017		Soil	S17-My07734			X									
25	JB20_1.25-1.35	May 06, 2017		Soil	S17-My07735							X			X		
26	JB20_1.5-1.6	May 06, 2017		Soil	S17-My07736			X									
27	JB20_1.7-1.8	May 06, 2017		Soil	S17-My07737		X			X	X			X	X		X
28	JB20_1.9-2.0	May 06, 2017		Soil	S17-My07738	X			X						X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
29	JB11_0.0-0.05	May 06, 2017		Soil	S17-My07739			X									
30	JB11_0.05-0.15	May 06, 2017		Soil	S17-My07740		X	X		X	X			X	X		X
31	JB11_0.25-0.35	May 06, 2017		Soil	S17-My07741			X									
32	JB11_0.35-0.45	May 06, 2017		Soil	S17-My07742	X			X						X	X	
33	QC20160506_1	May 06, 2017		Soil	S17-My07743		X			X	X			X	X		X
34	QC20160506_2	May 06, 2017		Soil	S17-My07744							X			X		
35	JB10_0.1-0.2	May 07, 2017		Soil	S17-My07847		X								X		X
36	JB10_0.3-0.4	May 07, 2017		Soil	S17-My07848			X									
37	JB10_0.4-0.5	May 07, 2017		Soil	S17-My07849			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
38	JB10_1.0-1.2	May 07, 2017		Soil	S17-My07850			X									
39	JB17_0.1-0.25	May 07, 2017		Soil	S17-My07851		X								X		X
40	JB17_0.25-0.35	May 07, 2017		Soil	S17-My07852			X									
41	JB17_1.1-1.2	May 07, 2017		Soil	S17-My07853			X									
42	JB07_0.1-0.2	May 07, 2017		Soil	S17-My07854							X		X	X		
43	JB07_0.2-0.3	May 07, 2017		Soil	S17-My07855			X									
44	JB07_1.1-1.2	May 07, 2017		Soil	S17-My07856			X									
45	JB14_0.1-0.3	May 07, 2017		Soil	S17-My07857		X								X		X
46	JB14_0.3-0.4	May 07, 2017		Soil	S17-My07858			X									
47	JB14_1.1-1.2	May 07, 2017		Soil	S17-My07859			X									
48	JB13_0.1-0.2	May 07, 2017		Soil	S17-My07860							X			X		

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Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract)	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Volatile Organics	Moisture Set	Cation Exchange Capacity	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
49	JB13_0.2-0.3	May 07, 2017		Soil	S17-My07861			X									
50	JB13_1.1-1.2	May 07, 2017		Soil	S17-My07862			X									
51	QC2017050701	May 07, 2017		Soil	S17-My07863			X									
52	JB12_0.1-0.25	May 07, 2017		Soil	S17-My07864		X							X	X		X
53	JB12_0.25-0.35	May 07, 2017		Soil	S17-My07865			X									
54	JB12_1.1-1.2	May 07, 2017		Soil	S17-My07866	X			X						X	X	
55	JB04_0.1-0.2	May 07, 2017		Soil	S17-My07867			X									
56	JB04_0.4-0.5	May 07, 2017		Soil	S17-My07868		X							X	X		X
57	JB04_0.5-0.6	May 07, 2017		Soil	S17-My07869			X									
58	JB04_1.1-1.2	May 07, 2017		Soil	S17-My07870			X									
59	JB05_0.1-0.2	May 07, 2017		Soil	S17-My07871							X			X		

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Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract)	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Volatile Organics	Moisture Set	Cation Exchange Capacity	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
60	JB05_0.5-0.6	May 07, 2017		Soil	S17-My07872			X									
61	JB05_0.6-0.7	May 07, 2017		Soil	S17-My07873			X									
62	JB05_1.1-1.2	May 07, 2017		Soil	S17-My07874			X									
63	JB03_0.05-0.2	May 07, 2017		Soil	S17-My07875							X			X		
64	JB03_0.2-0.45	May 07, 2017		Soil	S17-My07876			X									
65	JB03_0.45-0.65	May 07, 2017		Soil	S17-My07877			X									
66	JB03_1.1-1.2	May 07, 2017		Soil	S17-My07878			X									
67	JB01_0.05-0.3	May 07, 2017		Soil	S17-My07879		X								X		X
68	JB01_0.3-0.4	May 07, 2017		Soil	S17-My07880			X									
69	JB01_1.1-1.2	May 07, 2017		Soil	S17-My07881	X			X			X			X	X	
70	QC20170507_2	May 07, 2017		Soil	S17-My07882			X									

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Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 545235
Phone: 02 8245 0300
Fax:

Received: May 10, 2017 12:00 PM
Due: May 17, 2017
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract)	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Volatile Organics	Moisture Set	Cation Exchange Capacity	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
71	JB02_0.05-0.25	May 07, 2017		Soil	S17-My07883							X			X		
72	JB02_0.25-0.35	May 07, 2017		Soil	S17-My07884			X									
73	JB02_1.1-1.2	May 07, 2017		Soil	S17-My07885			X									
74	RIN6-5	May 06, 2017		Water	S17-My07886		X			X	X			X	X		X
75	RIN7-5	May 07, 2017		Water	S17-My07887		X			X	X			X	X		X
76	TB	May 07, 2017		Water	S17-My07888								X				
77	TS	May 07, 2017		Water	S17-My07889								X				
Test Counts						4	16	46	4	8	8	10	2	13	31	4	16

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
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NSW 2000

Attention:	Rohan Hammond
Report	545235-AID
Project Name	PENRITH
Project ID	52372
Received Date	May 08, 2017
Date Reported	May 17, 2017

Methodology:

Asbestos ID	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. Bulk samples include building materials, soils and ores.
Subsampling Soil Samples	The whole sample submitted is first dried and then sieved through a 10mm sieve followed by a 2mm sieve. All fibrous matter viz greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) Iron ores - Sampling and Sample preparation procedures is employed. Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis in accordance with AS 4964-2004.
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated and where required interfering organic fibres or matter may be removed by treating the sample for several hours at a temperature not exceeding 400 ± 30°C. The resultant material is then ground and examined in accordance with AS 4964-2004.
Limit of Reporting	The nominal detection limit of the AS4964 method is around 0.01%. The examination of large sample sizes (at least 500 ml is recommended) may improve the likelihood of identifying asbestos material in the greater than 2 mm fraction. The NEPM screening level of 0.001% w/w asbestos in soil for FA and AF (i.e. non-bonded/friable asbestos) only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. NOTE: NATA News, September 2011 – page 34, states, “Weighing of fibres is problematic and can lead to loss of fibres and potential exposure for laboratory analysts. To request laboratories to report information which is outside the scope of AS 4964-2004 and the scope of their accreditation is misleading and is most unwise” therefore such values reported are outside the scope of Eurofins | mgt NATA accreditation as designated by an asterisk.

Project Name PENRITH
Project ID 52372
Date Sampled May 06, 2017 to May 07, 2017
Report 545235-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
JB08_0.1-0.2	17-My07714	May 06, 2017	Approximate Sample 606g Sample consisted of: Red-brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
JB06_0.1-0.2	17-My07719	May 06, 2017	Approximate Sample 555g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
JB18_0.1-0.2	17-My07724	May 06, 2017	Approximate Sample 506g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
JB19_1.6-1.7	17-My07730	May 06, 2017	Approximate Sample 400g Sample consisted of: Light brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
JB20_0.5-0.6	17-My07733	May 06, 2017	Approximate Sample 707g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
JB20_1.7-1.8	17-My07737	May 06, 2017	Approximate Sample 208g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.01% w/w.* Organic fibre detected. No respirable fibres detected.
JB11_0.05-0.15	17-My07740	May 06, 2017	Approximate Sample 641g Sample consisted of: Dark brown fine grain soil, rocks and organic debris	AF: Chrysotile, amosite and crocidolite asbestos detected in fibre cement fragments. Approximate raw weight of AF = 0.033g Estimated asbestos content in AF = 0.0040g* Total estimated asbestos concentration in AF = 0.00062% w/w* No asbestos detected at the reporting limit of 0.001% w/w.* Synthetic mineral fibre detected. Organic fibre detected.[M11]
QC20160506_1	17-My07743	May 06, 2017	Approximate Sample 752g Sample consisted of: Dark brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
JB10_0.1-0.2	17-My07847	May 07, 2017	Approximate Sample 754g Sample consisted of: Red-brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
JB17_0.1-0.25	17-My07851	May 07, 2017	Approximate Sample 806g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
JB14_0.1-0.3	17-My07857	May 07, 2017	Approximate Sample 956g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
JB12_0.1-0.25	17-My07864	May 07, 2017	Approximate Sample 827g Sample consisted of: Grey fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
JB04_0.4-0.5	17-My07868	May 07, 2017	Approximate Sample 818g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
JB01_0.05-0.3	17-My07879	May 07, 2017	Approximate Sample 496g Sample consisted of: Brown fine grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	May 17, 2017	Indefinite
Asbestos - LTM-ASB-8020	Sydney	May 17, 2017	Indefinite

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Project Name: PENRITH
Project ID: 52372

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Report #: 545235
Phone: 02 8245 0300
Fax:

Received: May 10, 2017 12:00 PM
Due: May 17, 2017
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	Asbestos - AS4964	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract)	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Volatile Organics	Moisture Set	Cation Exchange Capacity	Total Recoverable Hydrocarbons	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271																X	X		X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X													
Perth Laboratory - NATA Site # 18217																			
External Laboratory																			
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**														
1	JB09_0.15-0.20	May 06, 2017		Soil	S17-My07711								X			X			
2	JB09_0.2-0.3	May 06, 2017		Soil	S17-My07712				X										
3	JB09_0.45-0.55	May 06, 2017		Soil	S17-My07713				X										
4	JB08_0.1-0.2	May 06, 2017		Soil	S17-My07714			X	X							X			X
5	JB08_0.2-0.3	May 06, 2017		Soil	S17-My07715				X										
6	JB08_0.6-0.7	May 06, 2017		Soil	S17-My07716				X										
7	JB16_0.05-0.15	May 06, 2017		Soil	S17-My07717										X	X			

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	X		X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X													
Perth Laboratory - NATA Site # 18217																			
8	JB16_0.35-0.45	May 06, 2017		Soil	S17-My07718				X										
9	JB06_0.1-0.2	May 06, 2017		Soil	S17-My07719			X							X	X			X
10	JB06_0.4-0.5	May 06, 2017		Soil	S17-My07720				X										
11	JB15-0.1-0.2	May 06, 2017		Soil	S17-My07721						X	X	X			X			
12	JB15-0.4-0.5	May 06, 2017		Soil	S17-My07722				X										
13	JB15-0.5-0.6	May 06, 2017		Soil	S17-My07723				X										
14	JB18_0.1-0.2	May 06, 2017		Soil	S17-My07724			X			X	X			X	X			X
15	JB18_0.4-0.5	May 06, 2017		Soil	S17-My07725				X										
16	JB18_0.6-0.7	May 06, 2017		Soil	S17-My07726				X										
17	JB19_0.1-0.2	May 06, 2017		Soil	S17-My07727				X										
18	JB19_0.3-0.4	May 06, 2017		Soil	S17-My07728										X	X			

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	X		X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X													
Perth Laboratory - NATA Site # 18217																			
19	JB19_0.9-1.0	May 06, 2017		Soil	S17-My07729				X										
20	JB19_1.6-1.7	May 06, 2017		Soil	S17-My07730			X			X	X			X	X			X
21	JB19_1.8-1.9	May 06, 2017		Soil	S17-My07731				X										
22	JB20_0.05-0.15	May 06, 2017		Soil	S17-My07732				X										
23	JB20_0.5-0.6	May 06, 2017		Soil	S17-My07733			X								X			X
24	JB20_1.15-1.25	May 06, 2017		Soil	S17-My07734				X										
25	JB20_1.25-1.35	May 06, 2017		Soil	S17-My07735								X			X			
26	JB20_1.5-1.6	May 06, 2017		Soil	S17-My07736				X										
27	JB20_1.7-1.8	May 06, 2017		Soil	S17-My07737		X				X	X			X	X			X
28	JB20_1.9-2.0	May 06, 2017		Soil	S17-My07738	X				X						X	X		

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	X		X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X													
Perth Laboratory - NATA Site # 18217																			
29	JB11_0.0-0.05	May 06, 2017		Soil	S17-My07739				X										
30	JB11_0.05-0.15	May 06, 2017		Soil	S17-My07740			X	X		X	X			X	X			X
31	JB11_0.25-0.35	May 06, 2017		Soil	S17-My07741				X										
32	JB11_0.35-0.45	May 06, 2017		Soil	S17-My07742	X				X						X	X		
33	QC20160506_1	May 06, 2017		Soil	S17-My07743			X			X	X			X	X			X
34	QC20160506_2	May 06, 2017		Soil	S17-My07744								X			X			
35	JB10_0.1-0.2	May 07, 2017		Soil	S17-My07847			X								X			X
36	JB10_0.3-0.4	May 07, 2017		Soil	S17-My07848				X										
37	JB10_0.4-0.5	May 07, 2017		Soil	S17-My07849				X										

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	X		X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X													
Perth Laboratory - NATA Site # 18217																			
38	JB10_1.0-1.2	May 07, 2017		Soil	S17-My07850				X										
39	JB17_0.1-0.25	May 07, 2017		Soil	S17-My07851			X								X			X
40	JB17_0.25-0.35	May 07, 2017		Soil	S17-My07852				X										
41	JB17_1.1-1.2	May 07, 2017		Soil	S17-My07853				X										
42	JB07_0.1-0.2	May 07, 2017		Soil	S17-My07854								X		X	X			
43	JB07_0.2-0.3	May 07, 2017		Soil	S17-My07855				X										
44	JB07_1.1-1.2	May 07, 2017		Soil	S17-My07856				X										
45	JB14_0.1-0.3	May 07, 2017		Soil	S17-My07857			X								X			X
46	JB14_0.3-0.4	May 07, 2017		Soil	S17-My07858				X										
47	JB14_1.1-1.2	May 07, 2017		Soil	S17-My07859				X										
48	JB13_0.1-0.2	May 07, 2017		Soil	S17-My07860								X			X			

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	X		X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X													
Perth Laboratory - NATA Site # 18217																			
49	JB13_0.2-0.3	May 07, 2017		Soil	S17-My07861				X										
50	JB13_1.1-1.2	May 07, 2017		Soil	S17-My07862				X										
51	QC2017050701	May 07, 2017		Soil	S17-My07863				X										
52	JB12_0.1-0.25	May 07, 2017		Soil	S17-My07864			X							X	X			X
53	JB12_0.25-0.35	May 07, 2017		Soil	S17-My07865				X										
54	JB12_1.1-1.2	May 07, 2017		Soil	S17-My07866	X				X						X	X		
55	JB04_0.1-0.2	May 07, 2017		Soil	S17-My07867				X										
56	JB04_0.4-0.5	May 07, 2017		Soil	S17-My07868			X							X	X			X
57	JB04_0.5-0.6	May 07, 2017		Soil	S17-My07869				X										
58	JB04_1.1-1.2	May 07, 2017		Soil	S17-My07870				X										
59	JB05_0.1-0.2	May 07, 2017		Soil	S17-My07871								X			X			

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	X		X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X													
Perth Laboratory - NATA Site # 18217																			
60	JB05_0.5-0.6	May 07, 2017		Soil	S17-My07872				X										
61	JB05_0.6-0.7	May 07, 2017		Soil	S17-My07873				X										
62	JB05_1.1-1.2	May 07, 2017		Soil	S17-My07874				X										
63	JB03_0.05-0.2	May 07, 2017		Soil	S17-My07875								X			X			
64	JB03_0.2-0.45	May 07, 2017		Soil	S17-My07876				X										
65	JB03_0.45-0.65	May 07, 2017		Soil	S17-My07877				X										
66	JB03_1.1-1.2	May 07, 2017		Soil	S17-My07878				X										
67	JB01_0.05-0.3	May 07, 2017		Soil	S17-My07879			X								X			X
68	JB01_0.3-0.4	May 07, 2017		Soil	S17-My07880				X										
69	JB01_1.1-1.2	May 07, 2017		Soil	S17-My07881	X				X			X			X	X		
70	QC20170507_2	May 07, 2017		Soil	S17-My07882				X										

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Melbourne Laboratory - NATA Site # 1254 & 14271																X	X		X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X													
Perth Laboratory - NATA Site # 18217																			
71	JB02_0.05-0.25	May 07, 2017		Soil	S17-My07883								X			X			
72	JB02_0.25-0.35	May 07, 2017		Soil	S17-My07884				X										
73	JB02_1.1-1.2	May 07, 2017		Soil	S17-My07885				X										
74	RIN6-5	May 06, 2017		Water	S17-My07886			X			X	X			X			X	X
75	RIN7-5	May 07, 2017		Water	S17-My07887			X			X	X			X				X
76	TB	May 07, 2017		Water	S17-My07888									X					
77	TS	May 07, 2017		Water	S17-My07889									X					
Test Counts						4	1	15	46	4	8	8	10	2	13	29	4	1	16

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Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
COC	Chain of custody
SRA	Sample Receipt Advice
ISO	International Stardards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substatntial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

My07730, My07879: Sample received was less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable
M11	NATA accreditation does not cover the performance of this service.

Authorised by:

Nibha Vaidya — Senior Analyst-Asbestos (NSW)

Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

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Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **545235-S**
Project name PENRITH
Project ID 52372
Received Date May 08, 2017

Client Sample ID			**JB09_0.15-0.20**	**JB08_0.1-0.2**	**JB16_0.05-0.15**	**JB06_0.1-0.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S17-My07711**	**S17-My07714**	**S17-My07717**	**S17-My07719**
Date Sampled			**May 06, 2017**	**May 06, 2017**	**May 06, 2017**	**May 06, 2017**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	< 20
TRH C15-C28	50	mg/kg	-	< 50	-	< 50
TRH C29-C36	50	mg/kg	-	< 50	-	< 50
TRH C10-36 (Total)	50	mg/kg	-	< 50	-	< 50
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	90	-	88
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.1-Dichloroethene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2-Dibromoethane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2-Dichloroethane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2-Dichloropropane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.3-Dichloropropane	0.5	mg/kg	-	-	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
2-Butanone (MEK)	0.5	mg/kg	-	-	< 0.5	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	-	-	< 0.5	< 0.5
4-Chlorotoluene	0.5	mg/kg	-	-	< 0.5	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	-	< 0.5	< 0.5
Allyl chloride	0.5	mg/kg	-	-	< 0.5	< 0.5

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Client Sample ID			JB09_0.15-0.20	JB08_0.1-0.2	JB16_0.05-0.15	JB06_0.1-0.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S17-My07711**	**S17-My07714**	**S17-My07717**	**S17-My07719**
Date Sampled			**May 06, 2017**	**May 06, 2017**	**May 06, 2017**	**May 06, 2017**
Test/Reference	LOR	Unit				
Volatile Organics						
Benzene	0.1	mg/kg	-	-	< 0.1	< 0.1
Bromobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
Bromochloromethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Bromodichloromethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Bromoform	0.5	mg/kg	-	-	< 0.5	< 0.5
Bromomethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Carbon disulfide	0.5	mg/kg	-	-	< 0.5	< 0.5
Carbon Tetrachloride	0.5	mg/kg	-	-	< 0.5	< 0.5
Chlorobenzene	0.5	mg/kg	-	-	< 0.5	< 0.5
Chloroethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Chloroform	0.5	mg/kg	-	-	< 0.5	< 0.5
Chloromethane	0.5	mg/kg	-	-	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	-	-	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	-	-	< 0.5	< 0.5
Dibromochloromethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Dibromomethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	< 0.1
Iodomethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	-	-	< 0.5	< 0.5
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	< 0.2
Methylene Chloride	0.5	mg/kg	-	-	< 0.5	< 0.5
o-Xylene	0.1	mg/kg	-	-	< 0.1	< 0.1
Styrene	0.5	mg/kg	-	-	< 0.5	< 0.5
Tetrachloroethene	0.5	mg/kg	-	-	< 0.5	< 0.5
Toluene	0.1	mg/kg	-	-	< 0.1	< 0.1
trans-1.2-Dichloroethene	0.5	mg/kg	-	-	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	-	-	< 0.5	< 0.5
Trichloroethene	0.5	mg/kg	-	-	< 0.5	< 0.5
Trichlorofluoromethane	0.5	mg/kg	-	-	< 0.5	< 0.5
Vinyl chloride	0.5	mg/kg	-	-	< 0.5	< 0.5
Xylenes - Total	0.3	mg/kg	-	-	< 0.3	< 0.3
Fluorobenzene (surr.)	1	%	-	-	100	97
4-Bromofluorobenzene (surr.)	1	%	-	-	91	88
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-	< 50
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	-	< 0.5

Client Sample ID			JB09_0.15-0.20	JB08_0.1-0.2	JB16_0.05-0.15	JB06_0.1-0.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07711	S17-My07714	S17-My07717	S17-My07719
Date Sampled			May 06, 2017	May 06, 2017	May 06, 2017	May 06, 2017
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PAH*	0.5	mg/kg	-	< 0.5	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	109	-	92
p-Terphenyl-d14 (surr.)	1	%	-	107	-	79
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	< 50	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100	-	< 100
TRH >C34-C40	100	mg/kg	-	< 100	-	< 100
Phenolics (total)	0.1	mg/kg	-	< 0.1	-	< 0.1
% Moisture	1	%	8.9	8.2	8.6	7.1
Heavy Metals						
Arsenic	2	mg/kg	10	3.9	-	8.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	< 0.4
Chromium	5	mg/kg	46	17	-	69
Copper	5	mg/kg	28	< 5	-	< 5
Lead	5	mg/kg	15	6.5	-	13
Mercury	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Nickel	5	mg/kg	< 5	< 5	-	< 5
Zinc	5	mg/kg	7.2	12	-	< 5

Client Sample ID			JB15-0.1-0.2	JB18_0.1-0.2	JB19_0.3-0.4	JB19_1.6-1.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07721	S17-My07724	S17-My07728	S17-My07730
Date Sampled			May 06, 2017	May 06, 2017	May 06, 2017	May 06, 2017
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	< 20
TRH C15-C28	50	mg/kg	-	< 50	-	< 50
TRH C29-C36	50	mg/kg	-	< 50	-	< 50
TRH C10-36 (Total)	50	mg/kg	-	< 50	-	< 50
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	96	-	92

Client Sample ID			JB15-0.1-0.2	JB18_0.1-0.2	JB19_0.3-0.4	JB19_1.6-1.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07721	S17-My07724	S17-My07728	S17-My07730
Date Sampled			May 06, 2017	May 06, 2017	May 06, 2017	May 06, 2017
Test/Reference	LOR	Unit				
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
2-Butanone (MEK)	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Allyl chloride	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Benzene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Bromobenzene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Bromoform	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Bromomethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Carbon disulfide	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Chloroethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Chloroform	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Chloromethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Iodomethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
m&p-Xylenes	0.2	mg/kg	-	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
o-Xylene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
Styrene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Toluene	0.1	mg/kg	-	< 0.1	< 0.1	< 0.1
trans-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Client Sample ID			JB15-0.1-0.2	JB18_0.1-0.2	JB19_0.3-0.4	JB19_1.6-1.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07721	S17-My07724	S17-My07728	S17-My07730
Date Sampled			May 06, 2017	May 06, 2017	May 06, 2017	May 06, 2017
Test/Reference	LOR	Unit				
Volatile Organics						
Trichloroethene	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	mg/kg	-	< 0.5	< 0.5	< 0.5
Xylenes - Total	0.3	mg/kg	-	< 0.3	< 0.3	< 0.3
Fluorobenzene (surr.)	1	%	-	105	100	101
4-Bromofluorobenzene (surr.)	1	%	-	96	91	92
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-	< 50
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluorene	0.5	mg/kg	-	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Total PAH*	0.5	mg/kg	-	< 0.5	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	92	-	92
p-Terphenyl-d14 (surr.)	1	%	-	76	-	78
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05

Client Sample ID			JB15-0.1-0.2	JB18_0.1-0.2	JB19_0.3-0.4	JB19_1.6-1.7
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07721	S17-My07724	S17-My07728	S17-My07730
Date Sampled			May 06, 2017	May 06, 2017	May 06, 2017	May 06, 2017
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	-	< 1
Dibutylchlorendate (surr.)	1	%	75	79	-	71
Tetrachloro-m-xylene (surr.)	1	%	93	92	-	89
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Dibutylchlorendate (surr.)	1	%	75	79	-	71
Tetrachloro-m-xylene (surr.)	1	%	93	92	-	89
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	< 50	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100	-	< 100
TRH >C34-C40	100	mg/kg	-	< 100	-	< 100
Phenolics (total)	0.1	mg/kg	-	< 0.1	-	< 0.1
% Moisture	1	%	7.6	8.1	4.6	7.2
Heavy Metals						
Arsenic	2	mg/kg	13	7.5	-	5.0
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	< 0.4
Chromium	5	mg/kg	110	39	-	10
Copper	5	mg/kg	5.9	6.2	-	5.3
Lead	5	mg/kg	16	12	-	5.5
Mercury	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Nickel	5	mg/kg	< 5	< 5	-	5.4
Zinc	5	mg/kg	12	< 5	-	29

Client Sample ID			JB20_0.5-0.6	JB20_1.25-1.35	JB20_1.7-1.8	JB20_1.9-2.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07733	S17-My07735	S17-My07737	S17-My07738
Date Sampled			May 06, 2017	May 06, 2017	May 06, 2017	May 06, 2017
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	< 20	-
TRH C10-C14	20	mg/kg	< 20	-	< 20	-
TRH C15-C28	50	mg/kg	< 50	-	69	-
TRH C29-C36	50	mg/kg	< 50	-	58	-
TRH C10-36 (Total)	50	mg/kg	< 50	-	127	-

Client Sample ID			JB20_0.5-0.6	JB20_1.25-1.35	JB20_1.7-1.8	JB20_1.9-2.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07733	S17-My07735	S17-My07737	S17-My07738
Date Sampled			May 06, 2017	May 06, 2017	May 06, 2017	May 06, 2017
Test/Reference	LOR	Unit				
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	84	-	88	-
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1-Dichloroethene	0.5	mg/kg	-	-	< 0.5	-
1.1.1-Trichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1.2-Trichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	-	< 0.5	-
1.2-Dibromoethane	0.5	mg/kg	-	-	< 0.5	-
1.2-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	-
1.2-Dichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.2-Dichloropropane	0.5	mg/kg	-	-	< 0.5	-
1.2.3-Trichloropropane	0.5	mg/kg	-	-	< 0.5	-
1.2.4-Trimethylbenzene	0.5	mg/kg	-	-	< 0.5	-
1.3-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	-
1.3-Dichloropropane	0.5	mg/kg	-	-	< 0.5	-
1.3.5-Trimethylbenzene	0.5	mg/kg	-	-	< 0.5	-
1.4-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	-
2-Butanone (MEK)	0.5	mg/kg	-	-	< 0.5	-
2-Propanone (Acetone)	0.5	mg/kg	-	-	< 0.5	-
4-Chlorotoluene	0.5	mg/kg	-	-	< 0.5	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	-	< 0.5	-
Allyl chloride	0.5	mg/kg	-	-	< 0.5	-
Benzene	0.1	mg/kg	-	-	< 0.1	-
Bromobenzene	0.5	mg/kg	-	-	< 0.5	-
Bromochloromethane	0.5	mg/kg	-	-	< 0.5	-
Bromodichloromethane	0.5	mg/kg	-	-	< 0.5	-
Bromoform	0.5	mg/kg	-	-	< 0.5	-
Bromomethane	0.5	mg/kg	-	-	< 0.5	-
Carbon disulfide	0.5	mg/kg	-	-	< 0.5	-
Carbon Tetrachloride	0.5	mg/kg	-	-	< 0.5	-
Chlorobenzene	0.5	mg/kg	-	-	< 0.5	-
Chloroethane	0.5	mg/kg	-	-	< 0.5	-
Chloroform	0.5	mg/kg	-	-	< 0.5	-
Chloromethane	0.5	mg/kg	-	-	< 0.5	-
cis-1.2-Dichloroethene	0.5	mg/kg	-	-	< 0.5	-
cis-1.3-Dichloropropene	0.5	mg/kg	-	-	< 0.5	-
Dibromochloromethane	0.5	mg/kg	-	-	< 0.5	-
Dibromomethane	0.5	mg/kg	-	-	< 0.5	-
Dichlorodifluoromethane	0.5	mg/kg	-	-	< 0.5	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
Iodomethane	0.5	mg/kg	-	-	< 0.5	-
Isopropyl benzene (Cumene)	0.5	mg/kg	-	-	< 0.5	-

Client Sample ID			JB20_0.5-0.6	JB20_1.25-1.35	JB20_1.7-1.8	JB20_1.9-2.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07733	S17-My07735	S17-My07737	S17-My07738
Date Sampled			May 06, 2017	May 06, 2017	May 06, 2017	May 06, 2017
Test/Reference	LOR	Unit				
Volatile Organics						
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	-
Methylene Chloride	0.5	mg/kg	-	-	< 0.5	-
o-Xylene	0.1	mg/kg	-	-	< 0.1	-
Styrene	0.5	mg/kg	-	-	< 0.5	-
Tetrachloroethene	0.5	mg/kg	-	-	< 0.5	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
trans-1.2-Dichloroethene	0.5	mg/kg	-	-	< 0.5	-
trans-1.3-Dichloropropene	0.5	mg/kg	-	-	< 0.5	-
Trichloroethene	0.5	mg/kg	-	-	< 0.5	-
Trichlorofluoromethane	0.5	mg/kg	-	-	< 0.5	-
Vinyl chloride	0.5	mg/kg	-	-	< 0.5	-
Xylenes - Total	0.3	mg/kg	-	-	< 0.3	-
Fluorobenzene (surr.)	1	%	-	-	96	-
4-Bromofluorobenzene (surr.)	1	%	-	-	88	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50	-
TRH C6-C10	20	mg/kg	< 20	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	-	1.2	-
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-	1.0	-
Total PAH*	0.5	mg/kg	< 0.5	-	2.2	-
2-Fluorobiphenyl (surr.)	1	%	90	-	94	-
p-Terphenyl-d14 (surr.)	1	%	74	-	76	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	-	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	-	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	-	-	< 0.05	-
a-BHC	0.05	mg/kg	-	-	< 0.05	-
Aldrin	0.05	mg/kg	-	-	< 0.05	-

Client Sample ID			JB20_0.5-0.6	JB20_1.25-1.35	JB20_1.7-1.8	JB20_1.9-2.0
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07733	S17-My07735	S17-My07737	S17-My07738
Date Sampled			May 06, 2017	May 06, 2017	May 06, 2017	May 06, 2017
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
b-BHC	0.05	mg/kg	-	-	< 0.05	-
d-BHC	0.05	mg/kg	-	-	< 0.05	-
Dieldrin	0.05	mg/kg	-	-	< 0.05	-
Endosulfan I	0.05	mg/kg	-	-	< 0.05	-
Endosulfan II	0.05	mg/kg	-	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	-	-	< 0.05	-
Endrin	0.05	mg/kg	-	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	-	-	< 0.05	-
Endrin ketone	0.05	mg/kg	-	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	-	-	< 0.05	-
Heptachlor	0.05	mg/kg	-	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	-	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	-	-	< 0.05	-
Methoxychlor	0.2	mg/kg	-	-	< 0.2	-
Toxaphene	1	mg/kg	-	-	< 1	-
Dibutylchlorendate (surr.)	1	%	-	-	127	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	118	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1221	0.1	mg/kg	-	-	< 0.1	-
Aroclor-1232	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	-	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	-	-	< 0.5	-
Total PCB*	0.5	mg/kg	-	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	-	-	127	-
Tetrachloro-m-xylene (surr.)	1	%	-	-	118	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	-	< 50	-
TRH >C16-C34	100	mg/kg	< 100	-	110	-
TRH >C34-C40	100	mg/kg	< 100	-	< 100	-
% Clay	1	%	-	-	-	30
Conductivity (1:5 aqueous extract at 25°C)	10	uS/cm	-	-	-	110
pH (1:5 Aqueous extract)	0.1	pH Units	-	-	-	7.6
Phenolics (total)	0.1	mg/kg	< 0.1	-	< 0.1	-
% Moisture	1	%	16	14	23	13
Ion Exchange Properties						
Cation Exchange Capacity	0.05	meq/100g	-	-	-	20
Heavy Metals						
Arsenic	2	mg/kg	2.7	4.6	4.4	-
Cadmium	0.4	mg/kg	< 0.4	0.4	< 0.4	-
Chromium	5	mg/kg	10	12	9.2	-
Copper	5	mg/kg	< 5	25	31	-
Lead	5	mg/kg	8.0	49	110	-
Mercury	0.1	mg/kg	< 0.1	0.1	0.3	-
Nickel	5	mg/kg	< 5	7.7	5.8	-
Zinc	5	mg/kg	31	100	190	-

Client Sample ID Sample Matrix Eurofins | mgt Sample No. Date Sampled Test/Reference	LOR	Unit	JB11_0.05-0.15 Soil S17-My07740 May 06, 2017	JB11_0.35-0.45 Soil S17-My07742 May 06, 2017	QC20160506_1 Soil S17-My07743 May 06, 2017	QC20160506_2 Soil S17-My07744 May 06, 2017
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	< 20	-
TRH C10-C14	20	mg/kg	39	-	< 20	-
TRH C15-C28	50	mg/kg	480	-	< 50	-
TRH C29-C36	50	mg/kg	350	-	< 50	-
TRH C10-36 (Total)	50	mg/kg	869	-	< 50	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	86	-	96	-
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.1-Dichloroethene	0.5	mg/kg	< 0.5	-	< 0.5	-
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.2-Dibromoethane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	-	< 0.5	-
1.2-Dichloroethane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.2-Dichloropropane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5	-	< 0.5	-
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	-	< 0.5	-
1.3-Dichloropropane	0.5	mg/kg	< 0.5	-	< 0.5	-
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5	-	< 0.5	-
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	-	< 0.5	-
2-Butanone (MEK)	0.5	mg/kg	< 0.5	-	< 0.5	-
2-Propanone (Acetone)	0.5	mg/kg	< 0.5	-	< 0.5	-
4-Chlorotoluene	0.5	mg/kg	< 0.5	-	< 0.5	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5	-	< 0.5	-
Allyl chloride	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Bromobenzene	0.5	mg/kg	< 0.5	-	< 0.5	-
Bromochloromethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Bromodichloromethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Bromoform	0.5	mg/kg	< 0.5	-	< 0.5	-
Bromomethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Carbon disulfide	0.5	mg/kg	< 0.5	-	< 0.5	-
Carbon Tetrachloride	0.5	mg/kg	< 0.5	-	< 0.5	-
Chlorobenzene	0.5	mg/kg	< 0.5	-	< 0.5	-
Chloroethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Chloroform	0.5	mg/kg	< 0.5	-	< 0.5	-
Chloromethane	0.5	mg/kg	< 0.5	-	< 0.5	-
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	< 0.5	-
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	< 0.5	-

Client Sample ID			JB11_0.05-0.15	JB11_0.35-0.45	QC20160506_1	QC20160506_2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07740	S17-My07742	S17-My07743	S17-My07744
Date Sampled			May 06, 2017	May 06, 2017	May 06, 2017	May 06, 2017
Test/Reference	LOR	Unit				
Volatile Organics						
Dibromochloromethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibromomethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Dichlorodifluoromethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	-
Iodomethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5	-	< 0.5	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	-
Methylene Chloride	0.5	mg/kg	< 0.5	-	< 0.5	-
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	-
Styrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Tetrachloroethene	0.5	mg/kg	< 0.5	-	< 0.5	-
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	-
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	< 0.5	-
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	< 0.5	-
Trichloroethene	0.5	mg/kg	< 0.5	-	< 0.5	-
Trichlorofluoromethane	0.5	mg/kg	< 0.5	-	< 0.5	-
Vinyl chloride	0.5	mg/kg	< 0.5	-	< 0.5	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	-
Fluorobenzene (surr.)	1	%	95	-	105	-
4-Bromofluorobenzene (surr.)	1	%	86	-	96	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	51	-	< 50	-
TRH C6-C10	20	mg/kg	< 20	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	-	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	-	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	126	-	93	-
p-Terphenyl-d14 (surr.)	1	%	104	-	75	-

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Client Sample ID			JB11_0.05-0.15	JB11_0.35-0.45	QC20160506_1	QC20160506_2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07740	S17-My07742	S17-My07743	S17-My07744
Date Sampled			May 06, 2017	May 06, 2017	May 06, 2017	May 06, 2017
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	< 0.1	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	< 0.05	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	< 0.05	-
a-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Aldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
b-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
d-BHC	0.05	mg/kg	< 0.05	-	< 0.05	-
Dieldrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan I	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan II	0.05	mg/kg	< 0.05	-	< 0.05	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	< 0.05	-
Endrin ketone	0.05	mg/kg	< 0.05	-	< 0.05	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor	0.05	mg/kg	< 0.05	-	< 0.05	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	< 0.05	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	< 0.05	-
Methoxychlor	0.2	mg/kg	< 0.2	-	< 0.2	-
Toxaphene	1	mg/kg	< 1	-	< 1	-
Dibutylchlorendate (surr.)	1	%	134	-	77	-
Tetrachloro-m-xylene (surr.)	1	%	85	-	84	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	< 0.1	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	< 0.5	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	< 0.5	-
Total PCB*	0.5	mg/kg	< 0.5	-	< 0.5	-
Dibutylchlorendate (surr.)	1	%	134	-	77	-
Tetrachloro-m-xylene (surr.)	1	%	85	-	84	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	51	-	< 50	-
TRH >C16-C34	100	mg/kg	710	-	< 100	-
TRH >C34-C40	100	mg/kg	140	-	< 100	-
% Clay	1	%	-	28	-	-
Conductivity (1:5 aqueous extract at 25°C)	10	uS/cm	-	170	-	-
pH (1:5 Aqueous extract)	0.1	pH Units	-	8.3	-	-
Phenolics (total)	0.1	mg/kg	< 0.1	-	< 0.1	-
% Moisture	1	%	9.2	11	6.4	14
Ion Exchange Properties						
Cation Exchange Capacity	0.05	meq/100g	-	17	-	-

Client Sample ID			JB11_0.05-0.15	JB11_0.35-0.45	QC20160506_1	QC20160506_2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07740	S17-My07742	S17-My07743	S17-My07744
Date Sampled			May 06, 2017	May 06, 2017	May 06, 2017	May 06, 2017
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	2.7	-	8.6	8.1
Cadmium	0.4	mg/kg	< 0.4	-	< 0.4	< 0.4
Chromium	5	mg/kg	6.3	-	50	42
Copper	5	mg/kg	23	-	< 5	16
Lead	5	mg/kg	31	-	12	20
Mercury	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	-	< 5	< 5
Zinc	5	mg/kg	93	-	< 5	21

Client Sample ID			JB10_0.1-0.2	JB17_0.1-0.25	JB07_0.1-0.2	JB14_0.1-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07847	S17-My07851	S17-My07854	S17-My07857
Date Sampled			May 07, 2017	May 07, 2017	May 07, 2017	May 07, 2017
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	-	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	-	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	-	< 50
TRH C29-C36	50	mg/kg	< 50	58	-	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	58	-	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	92	141	-	149
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1-Dichloroethene	0.5	mg/kg	-	-	< 0.5	-
1.1.1-Trichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1.2-Trichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	-	< 0.5	-
1.2-Dibromoethane	0.5	mg/kg	-	-	< 0.5	-
1.2-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	-
1.2-Dichloroethane	0.5	mg/kg	-	-	< 0.5	-
1.2-Dichloropropane	0.5	mg/kg	-	-	< 0.5	-
1.2.3-Trichloropropane	0.5	mg/kg	-	-	< 0.5	-
1.2.4-Trimethylbenzene	0.5	mg/kg	-	-	< 0.5	-
1.3-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	-
1.3-Dichloropropane	0.5	mg/kg	-	-	< 0.5	-
1.3.5-Trimethylbenzene	0.5	mg/kg	-	-	< 0.5	-
1.4-Dichlorobenzene	0.5	mg/kg	-	-	< 0.5	-
2-Butanone (MEK)	0.5	mg/kg	-	-	< 0.5	-
2-Propanone (Acetone)	0.5	mg/kg	-	-	< 0.5	-
4-Chlorotoluene	0.5	mg/kg	-	-	< 0.5	-

Client Sample ID			JB10_0.1-0.2	JB17_0.1-0.25	JB07_0.1-0.2	JB14_0.1-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07847	S17-My07851	S17-My07854	S17-My07857
Date Sampled			May 07, 2017	May 07, 2017	May 07, 2017	May 07, 2017
Test/Reference	LOR	Unit				
Volatile Organics						
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	-	< 0.5	-
Allyl chloride	0.5	mg/kg	-	-	< 0.5	-
Benzene	0.1	mg/kg	-	-	< 0.1	-
Bromobenzene	0.5	mg/kg	-	-	< 0.5	-
Bromochloromethane	0.5	mg/kg	-	-	< 0.5	-
Bromodichloromethane	0.5	mg/kg	-	-	< 0.5	-
Bromoform	0.5	mg/kg	-	-	< 0.5	-
Bromomethane	0.5	mg/kg	-	-	< 0.5	-
Carbon disulfide	0.5	mg/kg	-	-	< 0.5	-
Carbon Tetrachloride	0.5	mg/kg	-	-	< 0.5	-
Chlorobenzene	0.5	mg/kg	-	-	< 0.5	-
Chloroethane	0.5	mg/kg	-	-	< 0.5	-
Chloroform	0.5	mg/kg	-	-	< 0.5	-
Chloromethane	0.5	mg/kg	-	-	< 0.5	-
cis-1.2-Dichloroethene	0.5	mg/kg	-	-	< 0.5	-
cis-1.3-Dichloropropene	0.5	mg/kg	-	-	< 0.5	-
Dibromochloromethane	0.5	mg/kg	-	-	< 0.5	-
Dibromomethane	0.5	mg/kg	-	-	< 0.5	-
Dichlorodifluoromethane	0.5	mg/kg	-	-	< 0.5	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
Iodomethane	0.5	mg/kg	-	-	< 0.5	-
Isopropyl benzene (Cumene)	0.5	mg/kg	-	-	< 0.5	-
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	-
Methylene Chloride	0.5	mg/kg	-	-	< 0.5	-
o-Xylene	0.1	mg/kg	-	-	< 0.1	-
Styrene	0.5	mg/kg	-	-	< 0.5	-
Tetrachloroethene	0.5	mg/kg	-	-	< 0.5	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
trans-1.2-Dichloroethene	0.5	mg/kg	-	-	< 0.5	-
trans-1.3-Dichloropropene	0.5	mg/kg	-	-	< 0.5	-
Trichloroethene	0.5	mg/kg	-	-	< 0.5	-
Trichlorofluoromethane	0.5	mg/kg	-	-	< 0.5	-
Vinyl chloride	0.5	mg/kg	-	-	< 0.5	-
Xylenes - Total	0.3	mg/kg	-	-	< 0.3	-
Fluorobenzene (surr.)	1	%	-	-	97	-
4-Bromofluorobenzene (surr.)	1	%	-	-	88	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	-	< 50
TRH C6-C10	20	mg/kg	< 20	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	-	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	-	1.2
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5

Client Sample ID			JB10_0.1-0.2	JB17_0.1-0.25	JB07_0.1-0.2	JB14_0.1-0.3
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07847	S17-My07851	S17-My07854	S17-My07857
Date Sampled			May 07, 2017	May 07, 2017	May 07, 2017	May 07, 2017
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Fluorene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Pyrene	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	100	INT	-	120
p-Terphenyl-d14 (surr.)	1	%	87	INT	-	101
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	< 50	< 50	-	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	-	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	-	< 100
Phenolics (total)	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
% Moisture	1	%	8.6	6.5	8.5	15
Heavy Metals						
Arsenic	2	mg/kg	8.8	10	7.8	5.0
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	0.8
Chromium	5	mg/kg	44	64	64	18
Copper	5	mg/kg	6.9	< 5	17	61
Lead	5	mg/kg	10	13	29	57
Mercury	0.1	mg/kg	< 0.1	< 0.1	0.4	0.3
Nickel	5	mg/kg	< 5	< 5	34	14
Zinc	5	mg/kg	< 5	< 5	57	200

Client Sample ID			JB13_0.1-0.2	JB12_0.1-0.25	JB12_1.1-1.2	JB04_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07860	S17-My07864	S17-My07866	S17-My07868
Date Sampled			May 07, 2017	May 07, 2017	May 07, 2017	May 07, 2017
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	< 20	-	< 20
TRH C10-C14	20	mg/kg	-	< 20	-	< 20
TRH C15-C28	50	mg/kg	-	87	-	< 50
TRH C29-C36	50	mg/kg	-	69	-	< 50
TRH C10-36 (Total)	50	mg/kg	-	156	-	< 50
BTEX						
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2

Client Sample ID			JB13_0.1-0.2	JB12_0.1-0.25	JB12_1.1-1.2	JB04_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07860	S17-My07864	S17-My07866	S17-My07868
Date Sampled			May 07, 2017	May 07, 2017	May 07, 2017	May 07, 2017
Test/Reference	LOR	Unit				
BTEX						
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	92	-	98
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.1-Dichloroethene	0.5	mg/kg	-	< 0.5	-	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.2-Dibromoethane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	< 0.5
1.2-Dichloroethane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.2-Dichloropropane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	-	< 0.5	-	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	< 0.5
1.3-Dichloropropane	0.5	mg/kg	-	< 0.5	-	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	-	< 0.5	-	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	-	< 0.5	-	< 0.5
2-Butanone (MEK)	0.5	mg/kg	-	< 0.5	-	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	-	< 0.5	-	< 0.5
4-Chlorotoluene	0.5	mg/kg	-	< 0.5	-	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	< 0.5	-	< 0.5
Allyl chloride	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Bromobenzene	0.5	mg/kg	-	< 0.5	-	< 0.5
Bromochloromethane	0.5	mg/kg	-	< 0.5	-	< 0.5
Bromodichloromethane	0.5	mg/kg	-	< 0.5	-	< 0.5
Bromoform	0.5	mg/kg	-	< 0.5	-	< 0.5
Bromomethane	0.5	mg/kg	-	< 0.5	-	< 0.5
Carbon disulfide	0.5	mg/kg	-	< 0.5	-	< 0.5
Carbon Tetrachloride	0.5	mg/kg	-	< 0.5	-	< 0.5
Chlorobenzene	0.5	mg/kg	-	< 0.5	-	< 0.5
Chloroethane	0.5	mg/kg	-	< 0.5	-	< 0.5
Chloroform	0.5	mg/kg	-	< 0.5	-	< 0.5
Chloromethane	0.5	mg/kg	-	< 0.5	-	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5	-	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibromochloromethane	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibromomethane	0.5	mg/kg	-	< 0.5	-	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	-	< 0.5	-	< 0.5
Ethylbenzene	0.1	mg/kg	-	< 0.1	-	< 0.1
Iodomethane	0.5	mg/kg	-	< 0.5	-	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	-	< 0.5	-	< 0.5
m&p-Xylenes	0.2	mg/kg	-	< 0.2	-	< 0.2
Methylene Chloride	0.5	mg/kg	-	< 0.5	-	< 0.5
o-Xylene	0.1	mg/kg	-	< 0.1	-	< 0.1
Styrene	0.5	mg/kg	-	< 0.5	-	< 0.5

Client Sample ID			JB13_0.1-0.2	JB12_0.1-0.25	JB12_1.1-1.2	JB04_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07860	S17-My07864	S17-My07866	S17-My07868
Date Sampled			May 07, 2017	May 07, 2017	May 07, 2017	May 07, 2017
Test/Reference	LOR	Unit				
Volatile Organics						
Tetrachloroethene	0.5	mg/kg	-	< 0.5	-	< 0.5
Toluene	0.1	mg/kg	-	< 0.1	-	< 0.1
trans-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5	-	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5	-	< 0.5
Trichloroethene	0.5	mg/kg	-	< 0.5	-	< 0.5
Trichlorofluoromethane	0.5	mg/kg	-	< 0.5	-	< 0.5
Vinyl chloride	0.5	mg/kg	-	< 0.5	-	< 0.5
Xylenes - Total	0.3	mg/kg	-	< 0.3	-	< 0.3
Fluorobenzene (surr.)	1	%	-	101	-	108
4-Bromofluorobenzene (surr.)	1	%	-	92	-	98
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	< 0.5	-	< 0.5
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50	-	< 50
TRH C6-C10	20	mg/kg	-	< 20	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20	-	< 20
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	0.6	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	1.2	-	1.2
Acenaphthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	< 0.5	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	< 0.5	-	< 0.5
Chrysene	0.5	mg/kg	-	< 0.5	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	< 0.5	-	< 0.5
Fluoranthene	0.5	mg/kg	-	< 0.5	-	0.5
Fluorene	0.5	mg/kg	-	< 0.5	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	< 0.5	-	< 0.5
Naphthalene	0.5	mg/kg	-	< 0.5	-	< 0.5
Phenanthrene	0.5	mg/kg	-	0.5	-	< 0.5
Pyrene	0.5	mg/kg	-	< 0.5	-	0.5
Total PAH*	0.5	mg/kg	-	0.5	-	1
2-Fluorobiphenyl (surr.)	1	%	-	121	-	112
p-Terphenyl-d14 (surr.)	1	%	-	102	-	94
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	< 50	-	< 50
TRH >C16-C34	100	mg/kg	-	120	-	< 100
TRH >C34-C40	100	mg/kg	-	< 100	-	< 100
% Clay	1	%	-	-	39	-
Conductivity (1:5 aqueous extract at 25°C)	10	uS/cm	-	-	130	-
pH (1:5 Aqueous extract)	0.1	pH Units	-	-	7.7	-
Phenolics (total)	0.1	mg/kg	-	< 0.1	-	< 0.1
% Moisture	1	%	13	6.8	12	19
Ion Exchange Properties						
Cation Exchange Capacity	0.05	meq/100g	-	-	13	-

Client Sample ID			JB13_0.1-0.2	JB12_0.1-0.25	JB12_1.1-1.2	JB04_0.4-0.5
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07860	S17-My07864	S17-My07866	S17-My07868
Date Sampled			May 07, 2017	May 07, 2017	May 07, 2017	May 07, 2017
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	5.6	< 2	-	3.8
Cadmium	0.4	mg/kg	< 0.4	< 0.4	-	< 0.4
Chromium	5	mg/kg	13	91	-	9.7
Copper	5	mg/kg	12	24	-	24
Lead	5	mg/kg	25	< 5	-	110
Mercury	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Nickel	5	mg/kg	6.4	75	-	7.2
Zinc	5	mg/kg	170	48	-	110

Client Sample ID			JB05_0.1-0.2	JB03_0.05-0.2	JB01_0.05-0.3	JB01_1.1-1.2
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My07871	S17-My07875	S17-My07879	S17-My07881
Date Sampled			May 07, 2017	May 07, 2017	May 07, 2017	May 07, 2017
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	-	< 20	-
TRH C10-C14	20	mg/kg	-	-	< 20	-
TRH C15-C28	50	mg/kg	-	-	< 50	-
TRH C29-C36	50	mg/kg	-	-	< 50	-
TRH C10-36 (Total)	50	mg/kg	-	-	< 50	-
BTEX						
Benzene	0.1	mg/kg	-	-	< 0.1	-
Toluene	0.1	mg/kg	-	-	< 0.1	-
Ethylbenzene	0.1	mg/kg	-	-	< 0.1	-
m&p-Xylenes	0.2	mg/kg	-	-	< 0.2	-
o-Xylene	0.1	mg/kg	-	-	< 0.1	-
Xylenes - Total	0.3	mg/kg	-	-	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	-	-	97	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	< 0.5	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	< 50	-
TRH C6-C10	20	mg/kg	-	-	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	< 20	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	0.9	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	1.2	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	1.5	-
Acenaphthene	0.5	mg/kg	-	-	< 0.5	-
Acenaphthylene	0.5	mg/kg	-	-	< 0.5	-
Anthracene	0.5	mg/kg	-	-	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	-	-	0.6	-
Benzo(a)pyrene	0.5	mg/kg	-	-	0.7	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	-	0.8	-
Benzo(g.h.i)perylene	0.5	mg/kg	-	-	0.7	-
Benzo(k)fluoranthene	0.5	mg/kg	-	-	0.5	-
Chrysene	0.5	mg/kg	-	-	0.7	-
Dibenz(a.h)anthracene	0.5	mg/kg	-	-	< 0.5	-
Fluoranthene	0.5	mg/kg	-	-	1.7	-

Client Sample ID			JB05_0.1-0.2	JB03_0.05-0.2	JB01_0.05-0.3	JB01_1.1-1.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S17-My07871**	**S17-My07875**	**S17-My07879**	**S17-My07881**
Date Sampled			**May 07, 2017**	**May 07, 2017**	**May 07, 2017**	**May 07, 2017**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Fluorene	0.5	mg/kg	-	-	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	-	< 0.5	-
Naphthalene	0.5	mg/kg	-	-	< 0.5	-
Phenanthrene	0.5	mg/kg	-	-	0.6	-
Pyrene	0.5	mg/kg	-	-	1.7	-
Total PAH*	0.5	mg/kg	-	-	8	-
2-Fluorobiphenyl (surr.)	1	%	-	-	INT	-
p-Terphenyl-d14 (surr.)	1	%	-	-	134	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	50	mg/kg	-	-	< 50	-
TRH >C16-C34	100	mg/kg	-	-	< 100	-
TRH >C34-C40	100	mg/kg	-	-	< 100	-
% Clay	1	%	-	-	-	43
Conductivity (1:5 aqueous extract at 25°C)	10	uS/cm	-	-	-	460
pH (1:5 Aqueous extract)	0.1	pH Units	-	-	-	5.6
Phenolics (total)	0.1	mg/kg	-	-	< 0.1	-
% Moisture	1	%	12	13	11	14
Ion Exchange Properties						
Cation Exchange Capacity	0.05	meq/100g	-	-	-	13
Heavy Metals						
Arsenic	2	mg/kg	9.0	2.9	12	3.4
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	21	7.7	14	9.9
Copper	5	mg/kg	42	7.3	17	17
Lead	5	mg/kg	120	120	110	6.2
Mercury	0.1	mg/kg	0.2	< 0.1	0.2	< 0.1
Nickel	5	mg/kg	27	< 5	7.3	< 5
Zinc	5	mg/kg	170	53	62	16

Client Sample ID			JB02_0.05-0.25
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**S17-My07883**
Date Sampled			**May 07, 2017**
Test/Reference	LOR	Unit	
% Moisture	1	%	14
Heavy Metals			
Arsenic	2	mg/kg	12
Cadmium	0.4	mg/kg	< 0.4
Chromium	5	mg/kg	7.3
Copper	5	mg/kg	13
Lead	5	mg/kg	87
Mercury	0.1	mg/kg	0.1
Nickel	5	mg/kg	5.2
Zinc	5	mg/kg	180

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	May 16, 2017	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	May 16, 2017	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 16, 2017	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	May 16, 2017	14 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 16, 2017	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Phenolics (total)	Melbourne	May 17, 2017	14 Day
- Method: APHA 5530B & D Phenols			
Metals M8	Sydney	May 16, 2017	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
Volatile Organics	Sydney	May 16, 2017	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Organochlorine Pesticides	Sydney	May 16, 2017	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	May 16, 2017	28 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
% Clay	Brisbane	May 16, 2017	6 Day
- Method: LTM-GEN-7040			
pH (1:5 Aqueous extract)	Sydney	May 16, 2017	7 Day
- Method: LTM-GEN-7090 pH in soil by ISE			
Conductivity (1:5 aqueous extract at 25°C)	Melbourne	May 16, 2017	7 Day
- Method: LTM-INO-4030			
Ion Exchange Properties	Melbourne	May 17, 2017	
% Moisture	Sydney	May 10, 2017	14 Day
- Method: LTM-GEN-7080 Moisture			

Document Set ID: 9547379
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Site # 18217

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 545235
Phone: 02 8245 0300
Fax:

Received: May 10, 2017 12:00 PM
Due: May 17, 2017
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract)	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Volatile Organics	Moisture Set	Cation Exchange Capacity	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
External Laboratory																	
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**												
1	JB09_0.15-0.20	May 06, 2017		Soil	S17-My07711							X			X		
2	JB09_0.2-0.3	May 06, 2017		Soil	S17-My07712			X									
3	JB09_0.45-0.55	May 06, 2017		Soil	S17-My07713			X									
4	JB08_0.1-0.2	May 06, 2017		Soil	S17-My07714		X	X							X		X
5	JB08_0.2-0.3	May 06, 2017		Soil	S17-My07715			X									
6	JB08_0.6-0.7	May 06, 2017		Soil	S17-My07716			X									
7	JB16_0.05-0.15	May 06, 2017		Soil	S17-My07717									X	X		

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Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
8	JB16_0.35-0.45	May 06, 2017		Soil	S17-My07718			X									
9	JB06_0.1-0.2	May 06, 2017		Soil	S17-My07719		X							X	X		X
10	JB06_0.4-0.5	May 06, 2017		Soil	S17-My07720			X									
11	JB15-0.1-0.2	May 06, 2017		Soil	S17-My07721					X	X	X			X		
12	JB15-0.4-0.5	May 06, 2017		Soil	S17-My07722			X									
13	JB15-0.5-0.6	May 06, 2017		Soil	S17-My07723			X									
14	JB18_0.1-0.2	May 06, 2017		Soil	S17-My07724		X			X	X			X	X		X
15	JB18_0.4-0.5	May 06, 2017		Soil	S17-My07725			X									
16	JB18_0.6-0.7	May 06, 2017		Soil	S17-My07726			X									
17	JB19_0.1-0.2	May 06, 2017		Soil	S17-My07727			X									
18	JB19_0.3-0.4	May 06, 2017		Soil	S17-My07728									X	X		

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Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract)	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Volatile Organics	Moisture Set	Cation Exchange Capacity	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
19	JB19_0.9-1.0	May 06, 2017		Soil	S17-My07729			X									
20	JB19_1.6-1.7	May 06, 2017		Soil	S17-My07730		X			X	X			X	X		X
21	JB19_1.8-1.9	May 06, 2017		Soil	S17-My07731			X									
22	JB20_0.05-0.15	May 06, 2017		Soil	S17-My07732			X									
23	JB20_0.5-0.6	May 06, 2017		Soil	S17-My07733		X								X		X
24	JB20_1.15-1.25	May 06, 2017		Soil	S17-My07734			X									
25	JB20_1.25-1.35	May 06, 2017		Soil	S17-My07735							X			X		
26	JB20_1.5-1.6	May 06, 2017		Soil	S17-My07736			X									
27	JB20_1.7-1.8	May 06, 2017		Soil	S17-My07737		X			X	X			X	X		X
28	JB20_1.9-2.0	May 06, 2017		Soil	S17-My07738	X			X						X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
29	JB11_0.0-0.05	May 06, 2017		Soil	S17-My07739			X									
30	JB11_0.05-0.15	May 06, 2017		Soil	S17-My07740		X	X		X	X			X	X		X
31	JB11_0.25-0.35	May 06, 2017		Soil	S17-My07741			X									
32	JB11_0.35-0.45	May 06, 2017		Soil	S17-My07742	X			X						X	X	
33	QC20160506_1	May 06, 2017		Soil	S17-My07743		X			X	X			X	X		X
34	QC20160506_2	May 06, 2017		Soil	S17-My07744							X			X		
35	JB10_0.1-0.2	May 07, 2017		Soil	S17-My07847		X								X		X
36	JB10_0.3-0.4	May 07, 2017		Soil	S17-My07848			X									
37	JB10_0.4-0.5	May 07, 2017		Soil	S17-My07849			X									

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 545235
Phone: 02 8245 0300
Fax:

Received: May 10, 2017 12:00 PM
Due: May 17, 2017
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract)	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Volatile Organics	Moisture Set	Cation Exchange Capacity	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
38	JB10_1.0-1.2	May 07, 2017		Soil	S17-My07850			X									
39	JB17_0.1-0.25	May 07, 2017		Soil	S17-My07851		X								X		X
40	JB17_0.25-0.35	May 07, 2017		Soil	S17-My07852			X									
41	JB17_1.1-1.2	May 07, 2017		Soil	S17-My07853			X									
42	JB07_0.1-0.2	May 07, 2017		Soil	S17-My07854							X		X	X		
43	JB07_0.2-0.3	May 07, 2017		Soil	S17-My07855			X									
44	JB07_1.1-1.2	May 07, 2017		Soil	S17-My07856			X									
45	JB14_0.1-0.3	May 07, 2017		Soil	S17-My07857		X								X		X
46	JB14_0.3-0.4	May 07, 2017		Soil	S17-My07858			X									
47	JB14_1.1-1.2	May 07, 2017		Soil	S17-My07859			X									
48	JB13_0.1-0.2	May 07, 2017		Soil	S17-My07860							X			X		

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Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
49	JB13_0.2-0.3	May 07, 2017		Soil	S17-My07861			X									
50	JB13_1.1-1.2	May 07, 2017		Soil	S17-My07862			X									
51	QC2017050701	May 07, 2017		Soil	S17-My07863			X									
52	JB12_0.1-0.25	May 07, 2017		Soil	S17-My07864		X							X	X		X
53	JB12_0.25-0.35	May 07, 2017		Soil	S17-My07865			X									
54	JB12_1.1-1.2	May 07, 2017		Soil	S17-My07866	X			X						X	X	
55	JB04_0.1-0.2	May 07, 2017		Soil	S17-My07867			X									
56	JB04_0.4-0.5	May 07, 2017		Soil	S17-My07868		X							X	X		X
57	JB04_0.5-0.6	May 07, 2017		Soil	S17-My07869			X									
58	JB04_1.1-1.2	May 07, 2017		Soil	S17-My07870			X									
59	JB05_0.1-0.2	May 07, 2017		Soil	S17-My07871							X			X		

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Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract)	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Volatile Organics	Moisture Set	Cation Exchange Capacity	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
60	JB05_0.5-0.6	May 07, 2017		Soil	S17-My07872			X									
61	JB05_0.6-0.7	May 07, 2017		Soil	S17-My07873			X									
62	JB05_1.1-1.2	May 07, 2017		Soil	S17-My07874			X									
63	JB03_0.05-0.2	May 07, 2017		Soil	S17-My07875							X			X		
64	JB03_0.2-0.45	May 07, 2017		Soil	S17-My07876			X									
65	JB03_0.45-0.65	May 07, 2017		Soil	S17-My07877			X									
66	JB03_1.1-1.2	May 07, 2017		Soil	S17-My07878			X									
67	JB01_0.05-0.3	May 07, 2017		Soil	S17-My07879		X								X		X
68	JB01_0.3-0.4	May 07, 2017		Soil	S17-My07880			X									
69	JB01_1.1-1.2	May 07, 2017		Soil	S17-My07881	X			X			X			X	X	
70	QC20170507_2	May 07, 2017		Soil	S17-My07882			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
71	JB02_0.05-0.25	May 07, 2017		Soil	S17-My07883							X			X		
72	JB02_0.25-0.35	May 07, 2017		Soil	S17-My07884			X									
73	JB02_1.1-1.2	May 07, 2017		Soil	S17-My07885			X									
74	RIN6-5	May 06, 2017		Water	S17-My07886		X			X	X			X	X		X
75	RIN7-5	May 07, 2017		Water	S17-My07887		X			X	X			X	X		X
76	TB	May 07, 2017		Water	S17-My07888								X				
77	TS	May 07, 2017		Water	S17-My07889								X				
Test Counts						4	16	46	4	8	8	10	2	13	31	4	16

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dibromoethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
2-Butanone (MEK)	mg/kg	< 0.5			0.5	Pass	
2-Propanone (Acetone)	mg/kg	< 0.5			0.5	Pass	
4-Chlorotoluene	mg/kg	< 0.5			0.5	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.5			0.5	Pass	
Allyl chloride	mg/kg	< 0.5			0.5	Pass	
Benzene	mg/kg	< 0.1			0.1	Pass	
Bromobenzene	mg/kg	< 0.5			0.5	Pass	
Bromochloromethane	mg/kg	< 0.5			0.5	Pass	
Bromodichloromethane	mg/kg	< 0.5			0.5	Pass	
Bromoform	mg/kg	< 0.5			0.5	Pass	
Bromomethane	mg/kg	< 0.5			0.5	Pass	
Carbon disulfide	mg/kg	< 0.5			0.5	Pass	
Carbon Tetrachloride	mg/kg	< 0.5			0.5	Pass	
Chlorobenzene	mg/kg	< 0.5			0.5	Pass	
Chloroethane	mg/kg	< 0.5			0.5	Pass	
Chloroform	mg/kg	< 0.5			0.5	Pass	
Chloromethane	mg/kg	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Dibromochloromethane	mg/kg	< 0.5			0.5	Pass	

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Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dibromomethane	mg/kg	< 0.5			0.5	Pass	
Dichlorodifluoromethane	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
Iodomethane	mg/kg	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	mg/kg	< 0.5			0.5	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
Methylene Chloride	mg/kg	< 0.5			0.5	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Styrene	mg/kg	< 0.5			0.5	Pass	
Tetrachloroethene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
trans-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Trichloroethene	mg/kg	< 0.5			0.5	Pass	
Trichlorofluoromethane	mg/kg	< 0.5			0.5	Pass	
Vinyl chloride	mg/kg	< 0.5			0.5	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
% Clay	%	< 1			1	Pass	
Phenolics (total)	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	76			70-130	Pass	
TRH C10-C14	%	98			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	114			70-130	Pass	
Toluene	%	129			70-130	Pass	
Ethylbenzene	%	106			70-130	Pass	
m&p-Xylenes	%	108			70-130	Pass	
o-Xylene	%	109			70-130	Pass	
Xylenes - Total	%	74			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethane	%	124			70-130	Pass	
1.1-Dichloroethene	%	81			70-130	Pass	
1.1.1-Trichloroethane	%	93			70-130	Pass	
1.1.1.2-Tetrachloroethane	%	95			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.1.2-Trichloroethane	%	112			70-130	Pass	
1.1.2.2-Tetrachloroethane	%	87			70-130	Pass	
1.2-Dibromoethane	%	110			70-130	Pass	
1.2-Dichlorobenzene	%	113			70-130	Pass	
1.2-Dichloroethane	%	115			70-130	Pass	
1.2-Dichloropropane	%	113			70-130	Pass	
1.2.3-Trichloropropane	%	119			70-130	Pass	
1.2.4-Trimethylbenzene	%	118			70-130	Pass	
1.3-Dichlorobenzene	%	114			70-130	Pass	
1.3-Dichloropropane	%	111			70-130	Pass	
1.3.5-Trimethylbenzene	%	118			70-130	Pass	
1.4-Dichlorobenzene	%	112			70-130	Pass	
2-Butanone (MEK)	%	80			70-130	Pass	
2-Propanone (Acetone)	%	89			70-130	Pass	
4-Chlorotoluene	%	114			70-130	Pass	
4-Methyl-2-pentanone (MIBK)	%	106			70-130	Pass	
Allyl chloride	%	73			70-130	Pass	
Bromobenzene	%	118			70-130	Pass	
Bromochloromethane	%	112			70-130	Pass	
Bromodichloromethane	%	112			70-130	Pass	
Bromoform	%	84			70-130	Pass	
Carbon disulfide	%	78			70-130	Pass	
Carbon Tetrachloride	%	92			70-130	Pass	
Chlorobenzene	%	90			70-130	Pass	
Chloroform	%	129			70-130	Pass	
Chloromethane	%	83			70-130	Pass	
cis-1.2-Dichloroethene	%	124			70-130	Pass	
cis-1.3-Dichloropropene	%	102			70-130	Pass	
Dibromochloromethane	%	105			70-130	Pass	
Dibromomethane	%	112			70-130	Pass	
Dichlorodifluoromethane	%	83			70-130	Pass	
Iodomethane	%	76			70-130	Pass	
Isopropyl benzene (Cumene)	%	88			70-130	Pass	
Methylene Chloride	%	81			70-130	Pass	
Styrene	%	84			70-130	Pass	
Tetrachloroethene	%	115			70-130	Pass	
trans-1.2-Dichloroethene	%	124			70-130	Pass	
trans-1.3-Dichloropropene	%	102			70-130	Pass	
Trichloroethene	%	112			70-130	Pass	
Trichlorofluoromethane	%	79			70-130	Pass	
Vinyl chloride	%	84			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	112			70-130	Pass	
TRH C6-C10	%	72			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	100			70-130	Pass	
Acenaphthylene	%	101			70-130	Pass	
Anthracene	%	102			70-130	Pass	
Benz(a)anthracene	%	100			70-130	Pass	
Benzo(a)pyrene	%	97			70-130	Pass	
Benzo(b&j)fluoranthene	%	104			70-130	Pass	
Benzo(g.h.i)perylene	%	90			70-130	Pass	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Benzo(k)fluoranthene	%	106			70-130	Pass	
Chrysene	%	111			70-130	Pass	
Dibenz(a.h)anthracene	%	87			70-130	Pass	
Fluoranthene	%	105			70-130	Pass	
Fluorene	%	104			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	93			70-130	Pass	
Naphthalene	%	108			70-130	Pass	
Phenanthrene	%	100			70-130	Pass	
Pyrene	%	104			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	92			70-130	Pass	
4.4'-DDD	%	89			70-130	Pass	
4.4'-DDE	%	95			70-130	Pass	
4.4'-DDT	%	85			70-130	Pass	
a-BHC	%	92			70-130	Pass	
Aldrin	%	98			70-130	Pass	
b-BHC	%	88			70-130	Pass	
d-BHC	%	100			70-130	Pass	
Dieldrin	%	91			70-130	Pass	
Endosulfan I	%	90			70-130	Pass	
Endosulfan II	%	88			70-130	Pass	
Endosulfan sulphate	%	88			70-130	Pass	
Endrin	%	76			70-130	Pass	
Endrin aldehyde	%	75			70-130	Pass	
Endrin ketone	%	89			70-130	Pass	
g-BHC (Lindane)	%	91			70-130	Pass	
Heptachlor	%	85			70-130	Pass	
Hexachlorobenzene	%	100			70-130	Pass	
Methoxychlor	%	86			70-130	Pass	
Toxaphene	%	88			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	98			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	108			70-130	Pass	
LCS - % Recovery							
% Clay	%	100			70-130	Pass	
Phenolics (total)	%	87			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	85			70-130	Pass	
Cadmium	%	84			70-130	Pass	
Chromium	%	88			70-130	Pass	
Copper	%	90			70-130	Pass	
Lead	%	87			70-130	Pass	
Mercury	%	99			70-130	Pass	
Nickel	%	86			70-130	Pass	
Zinc	%	86			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S17-My08526	NCP	%	89			70-130	Pass	
TRH C10-C14	S17-My10441	NCP	%	102			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Xylenes - Total	S17-My08526	NCP	%	88			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
Xylenes - Total	S17-My08526	NCP	%	88			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH C6-C10	S17-My08526	NCP	%	85			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S17-My13064	NCP	%	99			70-130	Pass	
Acenaphthylene	S17-My13064	NCP	%	102			70-130	Pass	
Anthracene	S17-My13064	NCP	%	103			70-130	Pass	
Benz(a)anthracene	S17-My13064	NCP	%	107			70-130	Pass	
Benzo(a)pyrene	S17-My13064	NCP	%	102			70-130	Pass	
Benzo(b&j)fluoranthene	S17-My13064	NCP	%	110			70-130	Pass	
Benzo(g.h.i)perylene	S17-My13064	NCP	%	105			70-130	Pass	
Benzo(k)fluoranthene	S17-My13064	NCP	%	105			70-130	Pass	
Chrysene	S17-My13064	NCP	%	114			70-130	Pass	
Dibenz(a.h)anthracene	S17-My13064	NCP	%	100			70-130	Pass	
Fluoranthene	S17-My13064	NCP	%	111			70-130	Pass	
Fluorene	S17-My13064	NCP	%	103			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S17-My13064	NCP	%	105			70-130	Pass	
Naphthalene	S17-My13064	NCP	%	104			70-130	Pass	
Phenanthrene	S17-My13064	NCP	%	98			70-130	Pass	
Pyrene	S17-My13064	NCP	%	109			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S17-My10441	NCP	%	113			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethane	S17-My08505	NCP	%	111			70-130	Pass	
1.1-Dichloroethene	S17-My08505	NCP	%	128			70-130	Pass	
1.1.1-Trichloroethane	S17-My08505	NCP	%	125			70-130	Pass	
1.1.1.2-Tetrachloroethane	S17-My08505	NCP	%	119			70-130	Pass	
1.1.2-Trichloroethane	S17-My08505	NCP	%	116			70-130	Pass	
1.1.2.2-Tetrachloroethane	S17-My08505	NCP	%	114			70-130	Pass	
1.2-Dibromoethane	S17-My08505	NCP	%	106			70-130	Pass	
1.2-Dichlorobenzene	S17-My08505	NCP	%	113			70-130	Pass	
1.2-Dichloroethane	S17-My08505	NCP	%	109			70-130	Pass	
1.2-Dichloropropane	S17-My08505	NCP	%	109			70-130	Pass	
1.2.3-Trichloropropane	S17-My08505	NCP	%	127			70-130	Pass	
1.2.4-Trimethylbenzene	S17-My08505	NCP	%	114			70-130	Pass	
1.3-Dichlorobenzene	S17-My08505	NCP	%	114			70-130	Pass	
1.3-Dichloropropane	S17-My08505	NCP	%	112			70-130	Pass	
1.3.5-Trimethylbenzene	S17-My08505	NCP	%	112			70-130	Pass	
1.4-Dichlorobenzene	S17-My08505	NCP	%	113			70-130	Pass	
2-Butanone (MEK)	S17-My08505	NCP	%	124			70-130	Pass	
2-Propanone (Acetone)	S17-My08505	NCP	%	103			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
4-Chlorotoluene	S17-My08505	NCP	%	114			70-130	Pass	
4-Methyl-2-pentanone (MIBK)	S17-My08505	NCP	%	111			70-130	Pass	
Allyl chloride	S17-My08505	NCP	%	121			70-130	Pass	
Bromobenzene	S17-My08505	NCP	%	116			70-130	Pass	
Bromochloromethane	S17-My08505	NCP	%	123			70-130	Pass	
Bromodichloromethane	S17-My08505	NCP	%	116			70-130	Pass	
Bromoform	S17-My08505	NCP	%	112			70-130	Pass	
Carbon Tetrachloride	S17-My08505	NCP	%	112			70-130	Pass	
Chlorobenzene	S17-My08505	NCP	%	101			70-130	Pass	
Chloroethane	S17-My08505	NCP	%	72			70-130	Pass	
Chloroform	S17-My08505	NCP	%	128			70-130	Pass	
Chloromethane	S17-My08505	NCP	%	71			70-130	Pass	
cis-1.2-Dichloroethene	S17-My08505	NCP	%	125			70-130	Pass	
cis-1.3-Dichloropropene	S17-My08505	NCP	%	98			70-130	Pass	
Dibromochloromethane	S17-My08505	NCP	%	112			70-130	Pass	
Dibromomethane	S17-My08505	NCP	%	106			70-130	Pass	
Dichlorodifluoromethane	S17-My08505	NCP	%	70			70-130	Pass	
Iodomethane	S17-My08505	NCP	%	118			70-130	Pass	
Isopropyl benzene (Cumene)	S17-My08505	NCP	%	101			70-130	Pass	
Methylene Chloride	S17-My08505	NCP	%	123			70-130	Pass	
Styrene	S17-My08505	NCP	%	98			70-130	Pass	
Tetrachloroethene	S17-My08505	NCP	%	90			70-130	Pass	
trans-1.2-Dichloroethene	S17-My08505	NCP	%	126			70-130	Pass	
trans-1.3-Dichloropropene	S17-My08505	NCP	%	96			70-130	Pass	
Trichloroethene	S17-My08505	NCP	%	93			70-130	Pass	
Trichlorofluoromethane	S17-My08505	NCP	%	87			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S17-My09443	NCP	%	85			70-130	Pass	
4.4'-DDD	S17-My09443	NCP	%	100			70-130	Pass	
4.4'-DDE	S17-My09443	NCP	%	87			70-130	Pass	
4.4'-DDT	S17-My09706	NCP	%	78			70-130	Pass	
a-BHC	S17-My09443	NCP	%	86			70-130	Pass	
Aldrin	S17-My09443	NCP	%	88			70-130	Pass	
b-BHC	S17-My09443	NCP	%	81			70-130	Pass	
d-BHC	S17-My09443	NCP	%	92			70-130	Pass	
Dieldrin	S17-My09443	NCP	%	84			70-130	Pass	
Endosulfan I	S17-My09443	NCP	%	85			70-130	Pass	
Endosulfan II	S17-My09443	NCP	%	77			70-130	Pass	
Endosulfan sulphate	S17-My10323	NCP	%	103			70-130	Pass	
Endrin	S17-My10323	NCP	%	92			70-130	Pass	
Endrin aldehyde	S17-My09443	NCP	%	79			70-130	Pass	
Endrin ketone	S17-My09443	NCP	%	76			70-130	Pass	
g-BHC (Lindane)	S17-My09443	NCP	%	77			70-130	Pass	
Heptachlor	S17-My10323	NCP	%	86			70-130	Pass	
Heptachlor epoxide	S17-My09443	NCP	%	82			70-130	Pass	
Hexachlorobenzene	S17-My10443	NCP	%	116			70-130	Pass	
Methoxychlor	S17-My09706	NCP	%	83			70-130	Pass	
Toxaphene	S17-My10443	NCP	%	89			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S17-My09443	NCP	%	111			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Arsenic	S17-My07733	CP	%	80			70-130	Pass	
Cadmium	S17-My07733	CP	%	83			70-130	Pass	
Chromium	S17-My07733	CP	%	84			70-130	Pass	
Copper	S17-My07733	CP	%	81			70-130	Pass	
Lead	S17-My07733	CP	%	80			70-130	Pass	
Mercury	S17-My07733	CP	%	105			70-130	Pass	
Nickel	S17-My07733	CP	%	80			70-130	Pass	
Zinc	S17-My07733	CP	%	99			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S17-My07879	CP	%	119			70-130	Pass	
Toluene	S17-My07879	CP	%	117			70-130	Pass	
Ethylbenzene	S17-My07879	CP	%	122			70-130	Pass	
m&p-Xylenes	S17-My07879	CP	%	123			70-130	Pass	
o-Xylene	S17-My07879	CP	%	125			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S17-My07879	CP	%	113			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S17-My10440	NCP	mg/kg	3.5	3.1	15	30%	Pass	
Mercury	S17-My10440	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S17-My07717	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S17-My07717	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S17-My07717	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S17-My07717	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S17-My07717	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S17-My07717	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S17-My07717	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1-Dichloroethene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1-Trichloroethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2-Trichloroethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dibromoethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichlorobenzene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloroethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloropropane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3-Trichloropropane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trimethylbenzene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichlorobenzene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichloropropane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3.5-Trimethylbenzene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.4-Dichlorobenzene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Butanone (MEK)	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Propanone (Acetone)	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
4-Chlorotoluene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Allyl chloride	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromobenzene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromochloromethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromodichloromethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromoform	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromomethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon disulfide	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon Tetrachloride	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chlorobenzene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroform	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloromethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.2-Dichloroethene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.3-Dichloropropene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromochloromethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromomethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorodifluoromethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Iodomethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Isopropyl benzene (Cumene)	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Methylene Chloride	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Styrene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Tetrachloroethene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.2-Dichloroethene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.3-Dichloropropene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichloroethene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichlorofluoromethane	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Vinyl chloride	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S17-My07717	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S17-My07717	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S17-My07719	CP	%	7.1	7.0	3.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Cadmium	S17-My07730	CP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S17-My07730	CP	mg/kg	10	9.2	10	30%	Pass	
Copper	S17-My07730	CP	mg/kg	5.3	5.3	<1	30%	Pass	
Lead	S17-My07730	CP	mg/kg	5.5	5.8	5.0	30%	Pass	
Nickel	S17-My07730	CP	mg/kg	5.4	5.8	7.0	30%	Pass	
Zinc	S17-My07730	CP	mg/kg	29	28	3.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S17-My07737	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S17-My07737	CP	mg/kg	69	89	25	30%	Pass	
TRH C29-C36	S17-My07737	CP	mg/kg	58	85	38	30%	Fail	Q15

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S17-My07737	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S17-My07737	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S17-My07737	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S17-My07737	CP	mg/kg	< 0.5	0.6	28	30%	Pass	
Benzo(a)pyrene	S17-My07737	CP	mg/kg	< 0.5	0.6	32	30%	Fail	Q15
Benzo(b&j)fluoranthene	S17-My07737	CP	mg/kg	< 0.5	0.7	32	30%	Fail	Q15
Benzo(g.h.i)perylene	S17-My07737	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S17-My07737	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S17-My07737	CP	mg/kg	< 0.5	0.6	26	30%	Pass	
Dibenz(a.h)anthracene	S17-My07737	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S17-My07737	CP	mg/kg	1.2	1.5	25	30%	Pass	
Fluorene	S17-My07737	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S17-My07737	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S17-My07737	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S17-My07737	CP	mg/kg	< 0.5	0.6	25	30%	Pass	
Pyrene	S17-My07737	CP	mg/kg	1.0	1.3	29	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S17-My07737	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S17-My07737	CP	mg/kg	110	140	30	30%	Pass	
TRH >C34-C40	S17-My07737	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
pH (1:5 Aqueous extract)	S17-My09737	NCP	pH Units	9.6	9.6	pass	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S17-My07743	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S17-My07743	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S17-My07743	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S17-My07743	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S17-My07743	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S17-My07743	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S17-My07743	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S17-My07743	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S17-My07743	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1254	S17-My07743	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S17-My07743	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Clay	S17-My07866	CP	%	39	39	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S17-My07868	CP	%	19	18	4.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Huong Le	Senior Analyst-Inorganic (VIC)
Jonathon Angell	Senior Analyst-Inorganic (QLD)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)
Ryan Hamilton	Senior Analyst-Inorganic (NSW)
Ryan Hamilton	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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eurofins | mgt

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **545235-W**
Project name PENRITH
Project ID 52372
Received Date May 08, 2017

Client Sample ID			**RIN6-5**	**RIN7-5**	**TB**	**TS**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S17-My07886**	**S17-My07887**	**S17-My07888**	**S17-My07889**
Date Sampled			**May 06, 2017**	**May 07, 2017**	**May 07, 2017**	**May 07, 2017**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	-	-
TRH C10-C14	0.05	mg/L	0.05	< 0.05	-	-
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	-	-
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	-	-
TRH C10-36 (Total)	0.1	mg/L	< 0.1	< 0.1	-	-
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	105%
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	92%
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	92%
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	88%
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	85%
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	87%
4-Bromofluorobenzene (surr.)	1	%	97	95	93	96
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	-	-
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	-	-
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	-	-
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	-	-
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	-	-
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	-	-
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	-	-
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	-	-
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	-	-
2-Butanone (MEK)	0.001	mg/L	< 0.001	< 0.001	-	-
2-Propanone (Acetone)	0.001	mg/L	< 0.001	< 0.001	-	-
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	-	-
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	< 0.001	-	-
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	-	-

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Client Sample ID			RIN6-5	RIN7-5	TB	TS
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			S17-My07886	S17-My07887	S17-My07888	S17-My07889
Date Sampled			May 06, 2017	May 07, 2017	May 07, 2017	May 07, 2017
Test/Reference	LOR	Unit				
Volatile Organics						
Benzene	0.001	mg/L	< 0.001	< 0.001	-	-
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	-	-
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	-	-
Bromodichloromethane	0.001	mg/L	< 0.001	< 0.001	-	-
Bromoform	0.001	mg/L	< 0.001	< 0.001	-	-
Bromomethane	0.001	mg/L	< 0.001	< 0.001	-	-
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	-	-
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	-	-
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	-	-
Chloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
Chloroform	0.005	mg/L	< 0.005	< 0.005	-	-
Chloromethane	0.001	mg/L	< 0.001	< 0.001	-	-
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	-	-
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	-	-
Dibromochloromethane	0.001	mg/L	< 0.001	< 0.001	-	-
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	-	-
Dichlorodifluoromethane	0.001	mg/L	< 0.001	< 0.001	-	-
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	-	-
Iodomethane	0.001	mg/L	< 0.001	< 0.001	-	-
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	-	-
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	-	-
Methylene Chloride	0.001	mg/L	< 0.001	< 0.001	-	-
o-Xylene	0.001	mg/L	< 0.001	< 0.001	-	-
Styrene	0.001	mg/L	< 0.001	< 0.001	-	-
Tetrachloroethene	0.001	mg/L	< 0.001	< 0.001	-	-
Toluene	0.001	mg/L	< 0.001	< 0.001	-	-
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	-	-
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	-	-
Trichloroethene	0.001	mg/L	< 0.001	< 0.001	-	-
Trichlorofluoromethane	0.001	mg/L	< 0.001	< 0.001	-	-
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	-	-
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	-	-
Fluorobenzene (surr.)	1	%	89	107	-	-
4-Bromofluorobenzene (surr.)	1	%	97	95	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	0.05	< 0.05	-	-
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	-	-
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	-	-
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	< 0.001	-	-
Acenaphthylene	0.001	mg/L	< 0.001	< 0.001	-	-
Anthracene	0.001	mg/L	< 0.001	< 0.001	-	-
Benz(a)anthracene	0.001	mg/L	< 0.001	< 0.001	-	-
Benzo(a)pyrene	0.001	mg/L	< 0.001	< 0.001	-	-
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	< 0.001	-	-
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	< 0.001	-	-
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	< 0.001	-	-
Chrysene	0.001	mg/L	< 0.001	< 0.001	-	-

Client Sample ID			RIN6-5	RIN7-5	TB	TS
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			S17-My07886	S17-My07887	S17-My07888	S17-My07889
Date Sampled			May 06, 2017	May 07, 2017	May 07, 2017	May 07, 2017
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	< 0.001	-	-
Fluoranthene	0.001	mg/L	< 0.001	< 0.001	-	-
Fluorene	0.001	mg/L	< 0.001	< 0.001	-	-
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	< 0.001	-	-
Naphthalene	0.001	mg/L	< 0.001	< 0.001	-	-
Phenanthrene	0.001	mg/L	< 0.001	< 0.001	-	-
Pyrene	0.001	mg/L	< 0.001	< 0.001	-	-
Total PAH*	0.001	mg/L	< 0.001	< 0.001	-	-
2-Fluorobiphenyl (surr.)	1	%	81	80	-	-
p-Terphenyl-d14 (surr.)	1	%	142	145	-	-
Organochlorine Pesticides						
Chlordanes - Total	0.001	mg/L	< 0.001	< 0.001	-	-
4.4'-DDD	0.0001	mg/L	< 0.0001	< 0.0001	-	-
4.4'-DDE	0.0001	mg/L	< 0.0001	< 0.0001	-	-
4.4'-DDT	0.0001	mg/L	< 0.0001	< 0.0001	-	-
a-BHC	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Aldrin	0.0001	mg/L	< 0.0001	< 0.0001	-	-
b-BHC	0.0001	mg/L	< 0.0001	< 0.0001	-	-
d-BHC	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Dieldrin	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Endosulfan I	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Endosulfan II	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Endosulfan sulphate	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Endrin	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Endrin aldehyde	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Endrin ketone	0.0001	mg/L	< 0.0001	< 0.0001	-	-
g-BHC (Lindane)	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Heptachlor	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Heptachlor epoxide	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Hexachlorobenzene	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Methoxychlor	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Toxaphene	0.01	mg/L	< 0.01	< 0.01	-	-
Dibutylchlorendate (surr.)	1	%	75	109	-	-
Tetrachloro-m-xylene (surr.)	1	%	INT	INT	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.005	mg/L	< 0.005	< 0.005	-	-
Aroclor-1221	0.001	mg/L	< 0.001	< 0.001	-	-
Aroclor-1232	0.005	mg/L	< 0.005	< 0.005	-	-
Aroclor-1242	0.005	mg/L	< 0.005	< 0.005	-	-
Aroclor-1248	0.005	mg/L	< 0.005	< 0.005	-	-
Aroclor-1254	0.005	mg/L	< 0.005	< 0.005	-	-
Aroclor-1260	0.005	mg/L	< 0.005	< 0.005	-	-
Total PCB*	0.001	mg/L	< 0.001	< 0.001	-	-
Dibutylchlorendate (surr.)	1	%	75	109	-	-
Tetrachloro-m-xylene (surr.)	1	%	INT	INT	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16	0.05	mg/L	0.05	< 0.05	-	-
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	-	-
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	-	-

Client Sample ID			RIN6-5	RIN7-5	TB	TS
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S17-My07886**	**S17-My07887**	**S17-My07888**	**S17-My07889**
Date Sampled			**May 06, 2017**	**May 07, 2017**	**May 07, 2017**	**May 07, 2017**
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	0.001	mg/L	< 0.001	< 0.001	-	-
Cadmium	0.0002	mg/L	< 0.0002	< 0.0002	-	-
Chromium	0.001	mg/L	< 0.001	< 0.001	-	-
Copper	0.001	mg/L	0.001	0.001	-	-
Lead	0.001	mg/L	< 0.001	< 0.001	-	-
Mercury	0.0001	mg/L	< 0.0001	< 0.0001	-	-
Nickel	0.001	mg/L	< 0.001	< 0.001	-	-
Zinc	0.005	mg/L	< 0.005	< 0.005	-	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	May 10, 2017	7 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	May 10, 2017	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 10, 2017	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	May 10, 2017	7 Day
- Method: E007 Polyaromatic Hydrocarbons (PAH)			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 10, 2017	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Metals M8	Sydney	May 10, 2017	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			
Volatile Organics	Sydney	May 10, 2017	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Organochlorine Pesticides	Sydney	May 10, 2017	7 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	May 10, 2017	7 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 545235
Phone: 02 8245 0300
Fax:

Received: May 10, 2017 12:00 PM
Due: May 17, 2017
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract)	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Volatile Organics	Moisture Set	Cation Exchange Capacity	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
External Laboratory																	
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**												
1	JB09_0.15-0.20	May 06, 2017		Soil	S17-My07711							X			X		
2	JB09_0.2-0.3	May 06, 2017		Soil	S17-My07712			X									
3	JB09_0.45-0.55	May 06, 2017		Soil	S17-My07713			X									
4	JB08_0.1-0.2	May 06, 2017		Soil	S17-My07714		X	X							X		X
5	JB08_0.2-0.3	May 06, 2017		Soil	S17-My07715			X									
6	JB08_0.6-0.7	May 06, 2017		Soil	S17-My07716			X									
7	JB16_0.05-0.15	May 06, 2017		Soil	S17-My07717									X	X		

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Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
8	JB16_0.35-0.45	May 06, 2017		Soil	S17-My07718			X									
9	JB06_0.1-0.2	May 06, 2017		Soil	S17-My07719		X							X	X		X
10	JB06_0.4-0.5	May 06, 2017		Soil	S17-My07720			X									
11	JB15-0.1-0.2	May 06, 2017		Soil	S17-My07721					X	X	X			X		
12	JB15-0.4-0.5	May 06, 2017		Soil	S17-My07722			X									
13	JB15-0.5-0.6	May 06, 2017		Soil	S17-My07723			X									
14	JB18_0.1-0.2	May 06, 2017		Soil	S17-My07724		X			X	X			X	X		X
15	JB18_0.4-0.5	May 06, 2017		Soil	S17-My07725			X									
16	JB18_0.6-0.7	May 06, 2017		Soil	S17-My07726			X									
17	JB19_0.1-0.2	May 06, 2017		Soil	S17-My07727			X									
18	JB19_0.3-0.4	May 06, 2017		Soil	S17-My07728									X	X		

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Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
19	JB19_0.9-1.0	May 06, 2017		Soil	S17-My07729			X									
20	JB19_1.6-1.7	May 06, 2017		Soil	S17-My07730		X			X	X			X	X		X
21	JB19_1.8-1.9	May 06, 2017		Soil	S17-My07731			X									
22	JB20_0.05-0.15	May 06, 2017		Soil	S17-My07732			X									
23	JB20_0.5-0.6	May 06, 2017		Soil	S17-My07733		X								X		X
24	JB20_1.15-1.25	May 06, 2017		Soil	S17-My07734			X									
25	JB20_1.25-1.35	May 06, 2017		Soil	S17-My07735							X			X		
26	JB20_1.5-1.6	May 06, 2017		Soil	S17-My07736			X									
27	JB20_1.7-1.8	May 06, 2017		Soil	S17-My07737		X			X	X			X	X		X
28	JB20_1.9-2.0	May 06, 2017		Soil	S17-My07738	X			X						X	X	

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Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
29	JB11_0.0-0.05	May 06, 2017		Soil	S17-My07739			X									
30	JB11_0.05-0.15	May 06, 2017		Soil	S17-My07740		X	X		X	X			X	X		X
31	JB11_0.25-0.35	May 06, 2017		Soil	S17-My07741			X									
32	JB11_0.35-0.45	May 06, 2017		Soil	S17-My07742	X			X						X	X	
33	QC20160506_1	May 06, 2017		Soil	S17-My07743		X			X	X			X	X		X
34	QC20160506_2	May 06, 2017		Soil	S17-My07744							X			X		
35	JB10_0.1-0.2	May 07, 2017		Soil	S17-My07847		X								X		X
36	JB10_0.3-0.4	May 07, 2017		Soil	S17-My07848			X									
37	JB10_0.4-0.5	May 07, 2017		Soil	S17-My07849			X									

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Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
38	JB10_1.0-1.2	May 07, 2017		Soil	S17-My07850			X									
39	JB17_0.1-0.25	May 07, 2017		Soil	S17-My07851		X								X		X
40	JB17_0.25-0.35	May 07, 2017		Soil	S17-My07852			X									
41	JB17_1.1-1.2	May 07, 2017		Soil	S17-My07853			X									
42	JB07_0.1-0.2	May 07, 2017		Soil	S17-My07854							X		X	X		
43	JB07_0.2-0.3	May 07, 2017		Soil	S17-My07855			X									
44	JB07_1.1-1.2	May 07, 2017		Soil	S17-My07856			X									
45	JB14_0.1-0.3	May 07, 2017		Soil	S17-My07857		X								X		X
46	JB14_0.3-0.4	May 07, 2017		Soil	S17-My07858			X									
47	JB14_1.1-1.2	May 07, 2017		Soil	S17-My07859			X									
48	JB13_0.1-0.2	May 07, 2017		Soil	S17-My07860							X			X		

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Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract)	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Volatile Organics	Moisture Set	Cation Exchange Capacity	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
49	JB13_0.2-0.3	May 07, 2017		Soil	S17-My07861			X									
50	JB13_1.1-1.2	May 07, 2017		Soil	S17-My07862			X									
51	QC2017050701	May 07, 2017		Soil	S17-My07863			X									
52	JB12_0.1-0.25	May 07, 2017		Soil	S17-My07864		X							X	X		X
53	JB12_0.25-0.35	May 07, 2017		Soil	S17-My07865			X									
54	JB12_1.1-1.2	May 07, 2017		Soil	S17-My07866	X			X						X	X	
55	JB04_0.1-0.2	May 07, 2017		Soil	S17-My07867			X									
56	JB04_0.4-0.5	May 07, 2017		Soil	S17-My07868		X							X	X		X
57	JB04_0.5-0.6	May 07, 2017		Soil	S17-My07869			X									
58	JB04_1.1-1.2	May 07, 2017		Soil	S17-My07870			X									
59	JB05_0.1-0.2	May 07, 2017		Soil	S17-My07871							X			X		

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Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
60	JB05_0.5-0.6	May 07, 2017		Soil	S17-My07872			X									
61	JB05_0.6-0.7	May 07, 2017		Soil	S17-My07873			X									
62	JB05_1.1-1.2	May 07, 2017		Soil	S17-My07874			X									
63	JB03_0.05-0.2	May 07, 2017		Soil	S17-My07875							X			X		
64	JB03_0.2-0.45	May 07, 2017		Soil	S17-My07876			X									
65	JB03_0.45-0.65	May 07, 2017		Soil	S17-My07877			X									
66	JB03_1.1-1.2	May 07, 2017		Soil	S17-My07878			X									
67	JB01_0.05-0.3	May 07, 2017		Soil	S17-My07879		X								X		X
68	JB01_0.3-0.4	May 07, 2017		Soil	S17-My07880			X									
69	JB01_1.1-1.2	May 07, 2017		Soil	S17-My07881	X			X			X			X	X	
70	QC20170507_2	May 07, 2017		Soil	S17-My07882			X									

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Contact Name: Rohan Hammond

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Sample Detail						% Clay	Asbestos - WA guidelines	HOLD	pH (1:5 Aqueous extract)	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	BTEX	Volatile Organics	Moisture Set	Cation Exchange Capacity	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271															X	X	X
Sydney Laboratory - NATA Site # 18217							X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794						X											
Perth Laboratory - NATA Site # 18217																	
71	JB02_0.05-0.25	May 07, 2017		Soil	S17-My07883							X			X		
72	JB02_0.25-0.35	May 07, 2017		Soil	S17-My07884			X									
73	JB02_1.1-1.2	May 07, 2017		Soil	S17-My07885			X									
74	RIN6-5	May 06, 2017		Water	S17-My07886		X			X	X			X	X		X
75	RIN7-5	May 07, 2017		Water	S17-My07887		X			X	X			X	X		X
76	TB	May 07, 2017		Water	S17-My07888								X				
77	TS	May 07, 2017		Water	S17-My07889								X				
Test Counts						4	16	46	4	8	8	10	2	13	31	4	16

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Benzene	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dibromomethane	mg/L	< 0.001			0.001	Pass	
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.001			0.001	Pass	
4.4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	
Endosulfan I	mg/L	< 0.0001			0.0001	Pass	
Endosulfan II	mg/L	< 0.0001			0.0001	Pass	
Endosulfan sulphate	mg/L	< 0.0001			0.0001	Pass	
Endrin	mg/L	< 0.0001			0.0001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endrin aldehyde	mg/L	< 0.0001			0.0001	Pass	
Endrin ketone	mg/L	< 0.0001			0.0001	Pass	
g-BHC (Lindane)	mg/L	< 0.0001			0.0001	Pass	
Heptachlor	mg/L	< 0.0001			0.0001	Pass	
Heptachlor epoxide	mg/L	< 0.0001			0.0001	Pass	
Hexachlorobenzene	mg/L	< 0.0001			0.0001	Pass	
Methoxychlor	mg/L	< 0.0001			0.0001	Pass	
Toxaphene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/L	< 0.005			0.005	Pass	
Aroclor-1221	mg/L	< 0.001			0.001	Pass	
Aroclor-1232	mg/L	< 0.005			0.005	Pass	
Aroclor-1242	mg/L	< 0.005			0.005	Pass	
Aroclor-1248	mg/L	< 0.005			0.005	Pass	
Aroclor-1254	mg/L	< 0.005			0.005	Pass	
Aroclor-1260	mg/L	< 0.005			0.005	Pass	
Total PCB*	mg/L	< 0.001			0.001	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	127			70-130	Pass	
TRH C10-C14	%	99			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	111			70-130	Pass	
Toluene	%	103			70-130	Pass	
Ethylbenzene	%	106			70-130	Pass	
m&p-Xylenes	%	104			70-130	Pass	
o-Xylene	%	99			70-130	Pass	
Xylenes - Total	%	102			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethane	%	121			70-130	Pass	
1.1-Dichloroethene	%	122			70-130	Pass	
1.1.1-Trichloroethane	%	101			70-130	Pass	
1.1.1.2-Tetrachloroethane	%	106			70-130	Pass	
1.1.2-Trichloroethane	%	101			70-130	Pass	
1.1.2.2-Tetrachloroethane	%	96			70-130	Pass	
1.2-Dibromoethane	%	100			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.2-Dichlorobenzene	%	98			70-130	Pass	
1.2-Dichloroethane	%	99			70-130	Pass	
1.2-Dichloropropane	%	100			70-130	Pass	
1.2.3-Trichloropropane	%	114			70-130	Pass	
1.2.4-Trimethylbenzene	%	107			70-130	Pass	
1.3-Dichlorobenzene	%	100			70-130	Pass	
1.3-Dichloropropane	%	101			70-130	Pass	
1.3.5-Trimethylbenzene	%	106			70-130	Pass	
1.4-Dichlorobenzene	%	99			70-130	Pass	
2-Butanone (MEK)	%	106			70-130	Pass	
2-Propanone (Acetone)	%	100			70-130	Pass	
4-Chlorotoluene	%	100			70-130	Pass	
4-Methyl-2-pentanone (MIBK)	%	96			70-130	Pass	
Allyl chloride	%	126			70-130	Pass	
Benzene	%	100			70-130	Pass	
Bromobenzene	%	105			70-130	Pass	
Bromochloromethane	%	94			70-130	Pass	
Bromodichloromethane	%	99			70-130	Pass	
Bromoform	%	99			70-130	Pass	
Bromomethane	%	91			70-130	Pass	
Carbon disulfide	%	128			70-130	Pass	
Carbon Tetrachloride	%	100			70-130	Pass	
Chlorobenzene	%	97			70-130	Pass	
Chloroethane	%	85			70-130	Pass	
Chloroform	%	104			70-130	Pass	
Chloromethane	%	77			70-130	Pass	
cis-1.2-Dichloroethene	%	102			70-130	Pass	
cis-1.3-Dichloropropene	%	92			70-130	Pass	
Dibromochloromethane	%	96			70-130	Pass	
Dibromomethane	%	100			70-130	Pass	
Dichlorodifluoromethane	%	70			70-130	Pass	
Ethylbenzene	%	96			70-130	Pass	
Iodomethane	%	118			70-130	Pass	
Isopropyl benzene (Cumene)	%	94			70-130	Pass	
m&p-Xylenes	%	92			70-130	Pass	
Methylene Chloride	%	116			70-130	Pass	
o-Xylene	%	94			70-130	Pass	
Styrene	%	93			70-130	Pass	
Tetrachloroethene	%	111			70-130	Pass	
Toluene	%	93			70-130	Pass	
trans-1.2-Dichloroethene	%	122			70-130	Pass	
trans-1.3-Dichloropropene	%	93			70-130	Pass	
Trichloroethene	%	100			70-130	Pass	
Trichlorofluoromethane	%	84			70-130	Pass	
Vinyl chloride	%	82			70-130	Pass	
Xylenes - Total	%	92			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	115			70-130	Pass	
TRH C6-C10	%	113			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	86			70-130	Pass	
Acenaphthylene	%	91			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Anthracene	%	91			70-130	Pass	
Benz(a)anthracene	%	89			70-130	Pass	
Benzo(a)pyrene	%	86			70-130	Pass	
Benzo(b&j)fluoranthene	%	97			70-130	Pass	
Benzo(g.h.i)perylene	%	86			70-130	Pass	
Benzo(k)fluoranthene	%	95			70-130	Pass	
Chrysene	%	98			70-130	Pass	
Dibenz(a.h)anthracene	%	81			70-130	Pass	
Fluoranthene	%	92			70-130	Pass	
Fluorene	%	85			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	105			70-130	Pass	
Naphthalene	%	90			70-130	Pass	
Phenanthrene	%	92			70-130	Pass	
Pyrene	%	89			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	120			70-130	Pass	
4.4'-DDD	%	120			70-130	Pass	
4.4'-DDE	%	120			70-130	Pass	
4.4'-DDT	%	125			70-130	Pass	
a-BHC	%	110			70-130	Pass	
Aldrin	%	120			70-130	Pass	
b-BHC	%	120			70-130	Pass	
d-BHC	%	130			70-130	Pass	
Dieldrin	%	130			70-130	Pass	
Endosulfan I	%	125			70-130	Pass	
Endosulfan II	%	120			70-130	Pass	
Endosulfan sulphate	%	125			70-130	Pass	
Endrin	%	120			70-130	Pass	
Endrin aldehyde	%	115			70-130	Pass	
Endrin ketone	%	125			70-130	Pass	
g-BHC (Lindane)	%	120			70-130	Pass	
Heptachlor	%	110			70-130	Pass	
Heptachlor epoxide	%	80			70-130	Pass	
Methoxychlor	%	120			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	117			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH >C10-C16	%	99			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	95			70-130	Pass	
Cadmium	%	99			70-130	Pass	
Chromium	%	93			70-130	Pass	
Copper	%	93			70-130	Pass	
Lead	%	92			70-130	Pass	
Mercury	%	102			70-130	Pass	
Nickel	%	93			70-130	Pass	
Zinc	%	94			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S17-My10928	NCP	%	107			70-130	Pass	
Acenaphthylene	S17-My10928	NCP	%	103			70-130	Pass	
Anthracene	S17-My10928	NCP	%	113			70-130	Pass	
Benz(a)anthracene	S17-My10928	NCP	%	99			70-130	Pass	
Benzo(a)pyrene	S17-My10928	NCP	%	104			70-130	Pass	
Benzo(b&j)fluoranthene	S17-My10928	NCP	%	100			70-130	Pass	
Benzo(g.h.i)perylene	S17-My10928	NCP	%	113			70-130	Pass	
Benzo(k)fluoranthene	S17-My10928	NCP	%	115			70-130	Pass	
Chrysene	S17-My10928	NCP	%	115			70-130	Pass	
Dibenz(a.h)anthracene	S17-My10928	NCP	%	104			70-130	Pass	
Fluoranthene	S17-My10928	NCP	%	112			70-130	Pass	
Fluorene	S17-My10928	NCP	%	104			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S17-My10928	NCP	%	109			70-130	Pass	
Naphthalene	S17-My10928	NCP	%	108			70-130	Pass	
Phenanthrene	S17-My10928	NCP	%	114			70-130	Pass	
Pyrene	S17-My10928	NCP	%	113			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S17-My07928	NCP	%	80			70-130	Pass	
Cadmium	S17-My07928	NCP	%	94			70-130	Pass	
Chromium	S17-My07928	NCP	%	78			70-130	Pass	
Copper	S17-My07928	NCP	%	73			70-130	Pass	
Lead	S17-My07928	NCP	%	81			70-130	Pass	
Mercury	S17-My07928	NCP	%	90			70-130	Pass	
Nickel	S17-My07928	NCP	%	73			70-130	Pass	
Zinc	S17-My07928	NCP	%	71			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S17-My07887	CP	%	115			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S17-My07887	CP	%	100			70-130	Pass	
Toluene	S17-My07887	CP	%	94			70-130	Pass	
Ethylbenzene	S17-My07887	CP	%	97			70-130	Pass	
m&p-Xylenes	S17-My07887	CP	%	94			70-130	Pass	
o-Xylene	S17-My07887	CP	%	90			70-130	Pass	
Xylenes - Total	S17-My07887	CP	%	92			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S17-My07887	CP	%	88			70-130	Pass	
TRH C6-C10	S17-My07887	CP	%	101			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S17-My07886	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
TRH C10-C14	S17-My08539	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	S17-My08539	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	S17-My08539	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1-Dichloroethene	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.1-Trichloroethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.2-Trichloroethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dibromoethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichlorobenzene	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichloroethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichloropropane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2.3-Trichloropropane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2.4-Trimethylbenzene	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3-Dichlorobenzene	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3-Dichloropropane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3.5-Trimethylbenzene	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.4-Dichlorobenzene	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
2-Butanone (MEK)	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
2-Propanone (Acetone)	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4-Chlorotoluene	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Allyl chloride	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromobenzene	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromochloromethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromodichloromethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromoform	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromomethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Carbon disulfide	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Carbon Tetrachloride	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chlorobenzene	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chloroethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chloroform	S17-My07928	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Chloromethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
cis-1.2-Dichloroethene	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
cis-1.3-Dichloropropene	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibromochloromethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibromomethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dichlorodifluoromethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Iodomethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Isopropyl benzene (Cumene)	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Methylene Chloride	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Styrene	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Tetrachloroethene	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
trans-1.2-Dichloroethene	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
trans-1.3-Dichloropropene	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Trichloroethene	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Trichlorofluoromethane	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Vinyl chloride	S17-My07928	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C10	S17-My07886	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S17-My08394	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	S17-My08394	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	S17-My08394	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	S17-My08394	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	S17-My08394	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	S17-My08394	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	S17-My08394	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	S17-My08394	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	S17-My08394	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	S17-My08394	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	S17-My08394	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	S17-My08394	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S17-My08394	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	S17-My08394	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	S17-My08394	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	S17-My08394	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S17-My08539	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	S17-My08539	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	S17-My08539	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S17-My07926	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	S17-My07926	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	S17-My07926	NCP	mg/L	0.003	0.003	12	30%	Pass	
Copper	S17-My07926	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	S17-My07926	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	S17-My07926	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	S17-My07926	NCP	mg/L	0.001	0.001	4.0	30%	Pass	
Zinc	S17-My07926	NCP	mg/L	0.030	0.031	3.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Nibha Vaidya	Analytical Services Manager
Huong Le	Senior Analyst-Inorganic (VIC)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)
Ryan Hamilton	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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010789

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52372
PROJECT NAME: Penrith AST
DATE NEEDED BY: Std
PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688
SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) RHammond@jbsg.com.au; (3) .....@jbsg.com.au

LABORATORY BATCH NO.:
SAMPLERS: RH
QC LEVEL: NEPM (2013)

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

548083

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	TRH/BTEX	VOCs	OCP/PCB	Heavy Metals + FBI	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
JHA01 0.25-0.4	Soil	26/5/17	-	J + Icebrick + Bag	NA	X		X			X	
0.4-0.6												
JHA02 0.1-0.3									X			
0.3-0.5						X					X	
JHA03 0-0.2												
0.3-0.5												
JHA04 0.2-0.4						X	X				X	
0.4-0.6				-bag								
0.6-0.8				-bag			X		X			
JHA05 0-0.2									X			
0.2-0.5												
JHA06 0.2-0.4									X			
0.4-0.6						X					X	
0.8-1.0												
1.0-1.2						X	X	X			X	
JHA07 0.2-0.4												
0.4-0.6						X	X	X			X	
0.8-1.0				-bag								
1.3-1.5				-bag		[redacted]	X		X			

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: RHammond DATE: 29-5-17	CONSIGNMENT NOTE NO.	NAME: Rupan DATE: 29/05	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	OF: 13:50	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody – Generic

29 MAY 2017 13:50

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

010790

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52372	LABORATORY BATCH NO.:
PROJECT NAME: Penrith DSI	SAMPLERS: RM
DATE NEEDED BY: STD	QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) ....Rhammond.....@jbsg.com.au; (3) .....@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Asbestos	Heavy Metals	PCB/OCP	Heavy Metals	TPH/BTEX	PAH (LL)	VOCs	BTEX	PHENOLS	PAHs	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
JHA08 0.2-0.4	Soil	26/5/17	-	J+B + Ice block		X	X	X									X	
↓ 0.4-0.6	↓			↓			X											
PSM01	Water			Bottles, vials & Ice bath					X	X	X	X						
PSM02									X	X	X	X						
PSM03									X	X	X	X						
RINS								X	X	X		X		X	X			
TS/TB													X					
QC01-W									X	X	X	X						
QC20170526-1	Soil	↓	↓	J+ Ice block			X					X						

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Rohan H DATE: 29.5.17	CONSIGNMENT NOTE NO.	NAME:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 29/5/17 13:50	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE: 29/5/17	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO Forms013 – Chain of Custody - Generic

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
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NATA # 1261 Site # 18217

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Rohan Hammond
Project name: PENRITH DSI
Project ID: 52372
COC number: Not provided
Turn around time: 5 Day
Date/Time received: May 29, 2017 1:50 PM
Eurofins | mgt reference: **548083**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 10.8 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

No Bag received for JHA01_0.4-0.6, sample on HOLD|

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Rohan Hammond - rhammond@jbsg.com.au.

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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 18217

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH DSI
Project ID: 52372

Order No.:
Report #: 548083
Phone: 02 8245 0300
Fax:

Received: May 29, 2017 1:50 PM
Due: Jun 5, 2017
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Metals M8 filtered	Phenols (IWRG 621)	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271																		X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 18217																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	JHA01_0.25-0.4	May 26, 2017		Soil	S17-My29193	X			X	X						X		X
2	JHA02_0.1-0.3	May 26, 2017		Soil	S17-My29194						X					X		
3	JHA02_0.3-0.5	May 26, 2017		Soil	S17-My29195	X										X		X
4	JHA04_0.2-0.4	May 26, 2017		Soil	S17-My29196	X									X	X		X
5	JHA04_0.6-0.8	May 26, 2017		Soil	S17-My29197						X				X	X		
6	JHA05_0-0.2	May 26, 2017		Soil	S17-My29198						X					X		
7	JHA06_0.2-0.4	May 26, 2017		Soil	S17-My29199						X					X		
8	JHA06_0.4-0.6	May 26, 2017		Soil	S17-My29200	X										X		X
9	JHA06_1.0-1.2	May 26, 2017		Soil	S17-My29201	X			X	X					X	X		X

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Company Name: JBS & G Australia (NSW) P/L
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Project Name: PENRITH DSI
Project ID: 52372

Order No.:
Report #: 548083
Phone: 02 8245 0300
Fax:

Received: May 29, 2017 1:50 PM
Due: Jun 5, 2017
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Metals M8 filtered	Phenols (IWRG 621)	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271																		X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 18217																		
10	JHA07_0.4-0.6	May 26, 2017		Soil	S17-My29202	X			X	X					X	X		X
11	JHA07_1.3-1.5	May 26, 2017		Soil	S17-My29203										X	X		X
12	JHA08_0.2-0.4	May 26, 2017		Soil	S17-My29204	X			X	X	X					X		
13	JHA08_0.4-0.6	May 26, 2017		Soil	S17-My29205						X					X		
14	PSM01	May 26, 2017		Water	S17-My29206							X		X	X		X	
15	PSM02	May 26, 2017		Water	S17-My29207							X		X	X		X	
16	PSM03	May 26, 2017		Water	S17-My29208							X		X	X		X	
17	RINS	May 26, 2017		Water	S17-My29209			X	X	X	X		X	X	X		X	
18	TS	May 26, 2017		Water	S17-My29210									X				
19	TB	May 26, 2017		Water	S17-My29211									X				
20	QC01_W	May 26, 2017		Water	S17-My29212							X		X	X		X	
21	QC20170526-	May 26, 2017		Soil	S17-My29213						X				X	X		

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 18217																		
	1																	
22	PSM01	May 26, 2017		Water (Trace)	S17-My29214			X										
23	PSM02	May 26, 2017		Water (Trace)	S17-My29215			X										
24	PSM03	May 26, 2017		Water (Trace)	S17-My29216			X										
25	QC01_W	May 26, 2017		Water (Trace)	S17-My29217			X										
26	JHA01_0.4-0.6	May 26, 2017		Soil	S17-My29219		X											
27	JHA03_0-0.2	May 26, 2017		Soil	S17-My29220		X											
28	JHA03_0.3-0.5	May 26, 2017		Soil	S17-My29221		X											
29	JHA04_0.4-0.6	May 26, 2017		Soil	S17-My29222		X											
30	JHA05_0.2-0.5	May 26, 2017		Soil	S17-My29223		X											
31	JHA06_0.8-1.0	May 26, 2017		Soil	S17-My29224		X											
32	JHA07_0.2-0.4	May 26, 2017		Soil	S17-My29225		X											

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Melbourne Laboratory - NATA Site # 1254 & 14271																		X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 18217																		
33	JHA07_0.8-1.0	May 26, 2017		Soil	S17-My29226		X											
Test Counts						7	8	5	5	5	8	4	1	7	11	14	5	7

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

Attention:	Rohan Hammond
Report	548083-AID
Project Name	PENRITH DSI
Project ID	52372
Received Date	May 29, 2017
Date Reported	Jun 05, 2017

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS4964 method is around 0.1 g/kg (0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis where required, this is considered to be at the nominal reporting limit of 0.01 % (w / w).The examination of large sample sizes(500 mL is recommended) may improve the likelihood of identifying ACM in the > 2mm fraction.The NEPM screening level of 0.001 % (w / w) asbestos in soil for FA(friable asbestos) and AF(asbestos fines) then applies where they are able to be quantified by gravimetric procedures.This quantitative screening is not generally applicable to FF(free fibres) and results of Trace Analysis are referred. *NOTE: NATA News March 2014, p.7, states in relation to AS4964: "This is a qualitative method with a nominal reporting limit of 0.01%" and that currently in Australia "there is no validated method available for the quantification of asbestos". Accordingly, NATA Accreditation does not cover the performance of this service (indicated with an asterisk).* *This report is consistent with the analytical procedures and reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended) and the Western Australia Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia, 2009, including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil, June 2011.*

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Project Name PENRITH DSI
Project ID 52372
Date Sampled May 26, 2017
Report 548083-AID

Client Sample ID	Eurofins | mgt Sample No.	Date Sampled	Sample Description	Result
JHA01_0.25-0.4	17-My29193	May 26, 2017	Approximate Sample 756g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
JHA02_0.3-0.5	17-My29195	May 26, 2017	Approximate Sample 577g Sample consisted of: Dark brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
JHA04_0.2-0.4	17-My29196	May 26, 2017	Approximate Sample 653g Sample consisted of: Dark brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
JHA06_0.4-0.6	17-My29200	May 26, 2017	Approximate Sample 617g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
JHA06_1.0-1.2	17-My29201	May 26, 2017	Approximate Sample 605g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
JHA07_0.4-0.6	17-My29202	May 26, 2017	Approximate Sample 764g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]
JHA08_0.2-0.4	17-My29204	May 26, 2017	Approximate Sample 635g Sample consisted of: Brown coarse grain soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No respirable fibres detected.[M11]

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	May 29, 2017	Indefinite

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Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Metals M8 filtered	Phenols (IWRG 621)	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271																		X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 18217																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	JHA01_0.25-0.4	May 26, 2017		Soil	S17-My29193	X			X	X						X		X
2	JHA02_0.1-0.3	May 26, 2017		Soil	S17-My29194						X					X		
3	JHA02_0.3-0.5	May 26, 2017		Soil	S17-My29195	X										X		X
4	JHA04_0.2-0.4	May 26, 2017		Soil	S17-My29196	X									X	X		X
5	JHA04_0.6-0.8	May 26, 2017		Soil	S17-My29197						X				X	X		
6	JHA05_0-0.2	May 26, 2017		Soil	S17-My29198						X					X		
7	JHA06_0.2-0.4	May 26, 2017		Soil	S17-My29199						X					X		
8	JHA06_0.4-0.6	May 26, 2017		Soil	S17-My29200	X										X		X
9	JHA06_1.0-1.2	May 26, 2017		Soil	S17-My29201	X			X	X					X	X		X

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Melbourne Laboratory - NATA Site # 1254 & 14271																		X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 18217																		
10	JHA07_0.4-0.6	May 26, 2017		Soil	S17-My29202	X			X	X					X	X		X
11	JHA07_1.3-1.5	May 26, 2017		Soil	S17-My29203										X	X		X
12	JHA08_0.2-0.4	May 26, 2017		Soil	S17-My29204	X			X	X	X					X		
13	JHA08_0.4-0.6	May 26, 2017		Soil	S17-My29205						X					X		
14	PSM01	May 26, 2017		Water	S17-My29206							X		X	X		X	
15	PSM02	May 26, 2017		Water	S17-My29207							X		X	X		X	
16	PSM03	May 26, 2017		Water	S17-My29208							X		X	X		X	
17	RINS	May 26, 2017		Water	S17-My29209			X	X	X	X		X	X	X		X	
18	TS	May 26, 2017		Water	S17-My29210									X				
19	TB	May 26, 2017		Water	S17-My29211									X				
20	QC01_W	May 26, 2017		Water	S17-My29212							X		X	X		X	
21	QC20170526-	May 26, 2017		Soil	S17-My29213						X				X	X		

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Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Western Australia Department of Health
NOHSC	National Occupational Health and Safety Commission
ACM	Bonded asbestos-containing material means any material containing more than 1% asbestos and comprises asbestos-containing-material which is in sound condition, although possibly broken or fragmented, and where the asbestos is bound in a matrix such as cement or resin. Common examples of ACM include but are not limited to: pipe and boiler insulation, sprayed-on fireproofing, troweled-on acoustical plaster, floor tile and mastic, floor linoleum, transite shingles, roofing materials, wall and ceiling plaster, ceiling tiles, and gasket materials. This term is restricted to material that cannot pass a 7 mm x 7 mm sieve. This sieve size is selected because it approximates the thickness of common asbestos cement sheeting and for fragments to be smaller than this would imply a high degree of damage and hence potential for fibre release.
FA	FA comprises friable asbestos material and includes severely weathered cement sheet, insulation products and woven asbestos material. This type of friable asbestos is defined here as asbestos material that is in a degraded condition such that it can be broken or crumbled by hand pressure. This material is typically unbonded or was previously bonded and is now significantly degraded (crumbling).
PACM	Presumed Asbestos-Containing Material means thermal system insulation and surfacing material found in buildings, vessels, and vessel sections constructed no later than 1980 that are assumed to contain greater than one percent asbestos but have not been sampled or analyzed to verify or negate the presence of asbestos.
AF	Asbestos fines (AF) are defined as free fibres, or fibre bundles, smaller than 7mm. It is the free fibres which present the greatest risk to human health, although very small fibres (< 5 microns in length) are not considered to be such a risk. AF also includes small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve. (Note that for bonded ACM fragments to pass through a 7 mm x 7 mm sieve implies a substatntial degree of damage which increases the potential for fibre release.)
AC	Asbestos cement means a mixture of cement and asbestos fibres (typically 90:10 ratios).

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable
M11	NATA accreditation does not cover the performance of this service.

Authorised by:

Nibha Vaidya Senior Analyst-Asbestos (NSW)

Glenn Jackson
National Operations Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Uncertainty data is available on request

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **548083-S**
Project name PENRITH DSI
Project ID 52372
Received Date May 29, 2017

Client Sample ID			**JHA01_0.25-0.4**	**JHA02_0.1-0.3**	**JHA02_0.3-0.5**	**JHA04_0.2-0.4**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**S17-My29193**	**S17-My29194**	**S17-My29195**	**S17-My29196**
Date Sampled			**May 26, 2017**	**May 26, 2017**	**May 26, 2017**	**May 26, 2017**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	-	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	-	23	< 20
TRH C15-C28	50	mg/kg	< 50	-	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	-	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	-	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	-	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
Xylenes - Total	0.3	mg/kg	< 0.3	-	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	68	-	63	94
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dibromoethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichloroethane	0.5	mg/kg	-	-	-	< 0.5
1.2-Dichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	-	-	-	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
1.3-Dichloropropane	0.5	mg/kg	-	-	-	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	-	-	-	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	-	-	-	< 0.5
2-Butanone (MEK)	0.5	mg/kg	-	-	-	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	-	-	-	< 0.5
4-Chlorotoluene	0.5	mg/kg	-	-	-	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	-	-	< 0.5
Allyl chloride	0.5	mg/kg	-	-	-	< 0.5

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Client Sample ID			JHA01_0.25-0.4	JHA02_0.1-0.3	JHA02_0.3-0.5	JHA04_0.2-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My29193	S17-My29194	S17-My29195	S17-My29196
Date Sampled			May 26, 2017	May 26, 2017	May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit				
Volatile Organics						
Benzene	0.1	mg/kg	-	-	-	< 0.1
Bromobenzene	0.5	mg/kg	-	-	-	< 0.5
Bromochloromethane	0.5	mg/kg	-	-	-	< 0.5
Bromodichloromethane	0.5	mg/kg	-	-	-	< 0.5
Bromoform	0.5	mg/kg	-	-	-	< 0.5
Bromomethane	0.5	mg/kg	-	-	-	< 0.5
Carbon disulfide	0.5	mg/kg	-	-	-	< 0.5
Carbon Tetrachloride	0.5	mg/kg	-	-	-	< 0.5
Chlorobenzene	0.5	mg/kg	-	-	-	< 0.5
Chloroethane	0.5	mg/kg	-	-	-	< 0.5
Chloroform	0.5	mg/kg	-	-	-	< 0.5
Chloromethane	0.5	mg/kg	-	-	-	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	-	-	-	< 0.5
Dibromochloromethane	0.5	mg/kg	-	-	-	< 0.5
Dibromomethane	0.5	mg/kg	-	-	-	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	-	-	-	< 0.5
Ethylbenzene	0.1	mg/kg	-	-	-	< 0.1
Iodomethane	0.5	mg/kg	-	-	-	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	-	-	-	< 0.5
m&p-Xylenes	0.2	mg/kg	-	-	-	< 0.2
Methylene Chloride	0.5	mg/kg	-	-	-	< 0.5
o-Xylene	0.1	mg/kg	-	-	-	< 0.1
Styrene	0.5	mg/kg	-	-	-	< 0.5
Tetrachloroethene	0.5	mg/kg	-	-	-	3.7
Toluene	0.1	mg/kg	-	-	-	< 0.1
trans-1.2-Dichloroethene	0.5	mg/kg	-	-	-	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	-	-	-	< 0.5
Trichloroethene	0.5	mg/kg	-	-	-	< 0.5
Trichlorofluoromethane	0.5	mg/kg	-	-	-	< 0.5
Vinyl chloride	0.5	mg/kg	-	-	-	< 0.5
Xylenes - Total	0.3	mg/kg	-	-	-	< 0.3
Fluorobenzene (surr.)	1	%	-	-	-	94
4-Bromofluorobenzene (surr.)	1	%	-	-	-	94
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	-	< 20	< 20
TRH C6-C10	20	mg/kg	< 20	-	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	-	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	-	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	-	< 100	< 100
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	-	< 50	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	1.2	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	1.5	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	1.7	1.2
Acenaphthene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5

Client Sample ID			JHA01_0.25-0.4	JHA02_0.1-0.3	JHA02_0.3-0.5	JHA04_0.2-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My29193	S17-My29194	S17-My29195	S17-My29196
Date Sampled			May 26, 2017	May 26, 2017	May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	0.8	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	0.9	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	0.7	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	0.7	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	0.8	< 0.5
Chrysene	0.5	mg/kg	< 0.5	-	1.1	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Fluoranthene	0.5	mg/kg	0.8	-	2.3	< 0.5
Fluorene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	0.6	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	-	< 0.5	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	-	0.8	< 0.5
Pyrene	0.5	mg/kg	0.8	-	2.1	< 0.5
Total PAH*	0.5	mg/kg	1.6	-	10.8	< 0.5
2-Fluorobiphenyl (surr.)	1	%	146	-	122	91
p-Terphenyl-d14 (surr.)	1	%	109	-	101	67
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Dibutylchlorendate (surr.)	1	%	70	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	81	-	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID			JHA01_0.25-0.4	JHA02_0.1-0.3	JHA02_0.3-0.5	JHA04_0.2-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My29193	S17-My29194	S17-My29195	S17-My29196
Date Sampled			May 26, 2017	May 26, 2017	May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Total PCB*	0.5	mg/kg	< 0.5	-	-	-
Dibutylchlorendate (surr.)	1	%	70	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	81	-	-	-
Phenolics (total)	0.1	mg/kg	< 0.1	-	< 0.1	< 0.1
% Moisture	1	%	6.2	21	22	10
Heavy Metals						
Arsenic	2	mg/kg	3.9	50	49	2.7
Cadmium	0.4	mg/kg	< 0.4	0.5	0.5	< 0.4
Chromium	5	mg/kg	21	11	12	53
Copper	5	mg/kg	11	230	200	19
Lead	5	mg/kg	6.8	430	910	7.0
Mercury	0.1	mg/kg	< 0.1	0.3	0.4	< 0.1
Nickel	5	mg/kg	25	8.8	8.7	58
Zinc	5	mg/kg	29	290	340	38

Client Sample ID			JHA04_0.6-0.8	JHA05_0-0.2	JHA06_0.2-0.4	JHA06_0.4-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My29197	S17-My29198	S17-My29199	S17-My29200
Date Sampled			May 26, 2017	May 26, 2017	May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	-	-	-	< 20
TRH C10-C14	20	mg/kg	-	-	-	< 20
TRH C15-C28	50	mg/kg	-	-	-	< 50
TRH C29-C36	50	mg/kg	-	-	-	74
TRH C10-36 (Total)	50	mg/kg	-	-	-	74
BTEX						
Benzene	0.1	mg/kg	-	-	-	< 0.1
Toluene	0.1	mg/kg	-	-	-	< 0.1
Ethylbenzene	0.1	mg/kg	-	-	-	< 0.1
m&p-Xylenes	0.2	mg/kg	-	-	-	< 0.2
o-Xylene	0.1	mg/kg	-	-	-	< 0.1
Xylenes - Total	0.3	mg/kg	-	-	-	< 0.3
4-Bromofluorobenzene (surr.)	1	%	-	-	-	65
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dibromoethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichloroethane	0.5	mg/kg	< 0.5	-	-	-
1.2-Dichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5	-	-	-

Client Sample ID			JHA04_0.6-0.8	JHA05_0-0.2	JHA06_0.2-0.4	JHA06_0.4-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My29197	S17-My29198	S17-My29199	S17-My29200
Date Sampled			May 26, 2017	May 26, 2017	May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit				
Volatile Organics						
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5	-	-	-
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
1.3-Dichloropropane	0.5	mg/kg	< 0.5	-	-	-
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5	-	-	-
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	-	-	-
2-Butanone (MEK)	0.5	mg/kg	< 0.5	-	-	-
2-Propanone (Acetone)	0.5	mg/kg	< 0.5	-	-	-
4-Chlorotoluene	0.5	mg/kg	< 0.5	-	-	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5	-	-	-
Allyl chloride	0.5	mg/kg	< 0.5	-	-	-
Benzene	0.1	mg/kg	< 0.1	-	-	-
Bromobenzene	0.5	mg/kg	< 0.5	-	-	-
Bromochloromethane	0.5	mg/kg	< 0.5	-	-	-
Bromodichloromethane	0.5	mg/kg	< 0.5	-	-	-
Bromoform	0.5	mg/kg	< 0.5	-	-	-
Bromomethane	0.5	mg/kg	< 0.5	-	-	-
Carbon disulfide	0.5	mg/kg	< 0.5	-	-	-
Carbon Tetrachloride	0.5	mg/kg	< 0.5	-	-	-
Chlorobenzene	0.5	mg/kg	< 0.5	-	-	-
Chloroethane	0.5	mg/kg	< 0.5	-	-	-
Chloroform	0.5	mg/kg	< 0.5	-	-	-
Chloromethane	0.5	mg/kg	< 0.5	-	-	-
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	-	-
Dibromochloromethane	0.5	mg/kg	< 0.5	-	-	-
Dibromomethane	0.5	mg/kg	< 0.5	-	-	-
Dichlorodifluoromethane	0.5	mg/kg	< 0.5	-	-	-
Ethylbenzene	0.1	mg/kg	< 0.1	-	-	-
Iodomethane	0.5	mg/kg	< 0.5	-	-	-
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5	-	-	-
m&p-Xylenes	0.2	mg/kg	< 0.2	-	-	-
Methylene Chloride	0.5	mg/kg	< 0.5	-	-	-
o-Xylene	0.1	mg/kg	< 0.1	-	-	-
Styrene	0.5	mg/kg	< 0.5	-	-	-
Tetrachloroethene	0.5	mg/kg	0.6	-	-	-
Toluene	0.1	mg/kg	< 0.1	-	-	-
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5	-	-	-
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5	-	-	-
Trichloroethene	0.5	mg/kg	0.7	-	-	-
Trichlorofluoromethane	0.5	mg/kg	< 0.5	-	-	-
Vinyl chloride	0.5	mg/kg	< 0.5	-	-	-
Xylenes - Total	0.3	mg/kg	< 0.3	-	-	-
Fluorobenzene (surr.)	1	%	75	-	-	-
4-Bromofluorobenzene (surr.)	1	%	118	-	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	-	-	-	< 0.5
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	-	-	< 20
TRH C6-C10	20	mg/kg	-	-	-	< 20
TRH >C10-C16	50	mg/kg	-	-	-	< 50

Client Sample ID			JHA04_0.6-0.8	JHA05_0-0.2	JHA06_0.2-0.4	JHA06_0.4-0.6
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My29197	S17-My29198	S17-My29199	S17-My29200
Date Sampled			May 26, 2017	May 26, 2017	May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C16-C34	100	mg/kg	-	-	-	< 100
TRH >C34-C40	100	mg/kg	-	-	-	< 100
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	-	-	< 50
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	-	-	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	-	-	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	-	-	-	1.2
Acenaphthene	0.5	mg/kg	-	-	-	< 0.5
Acenaphthylene	0.5	mg/kg	-	-	-	< 0.5
Anthracene	0.5	mg/kg	-	-	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	-	-	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	-	-	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	-	-	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	-	-	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	-	-	-	< 0.5
Chrysene	0.5	mg/kg	-	-	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	-	-	-	< 0.5
Fluoranthene	0.5	mg/kg	-	-	-	< 0.5
Fluorene	0.5	mg/kg	-	-	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	-	-	-	< 0.5
Naphthalene	0.5	mg/kg	-	-	-	< 0.5
Phenanthrene	0.5	mg/kg	-	-	-	< 0.5
Pyrene	0.5	mg/kg	-	-	-	< 0.5
Total PAH*	0.5	mg/kg	-	-	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	-	-	-	97
p-Terphenyl-d14 (surr.)	1	%	-	-	-	72
Phenolics (total)	0.1	mg/kg	-	-	-	< 0.1
% Moisture	1	%	25	12	13	14
Heavy Metals						
Arsenic	2	mg/kg	8.4	4.4	2.2	6.4
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	16	24	8.0	14
Copper	5	mg/kg	21	15	8.9	20
Lead	5	mg/kg	27	39	15	37
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	14	22	6.8	11
Zinc	5	mg/kg	25	64	32	48

Client Sample ID			JHA06_1.0-1.2	JHA07_0.4-0.6	JHA07_1.3-1.5	JHA08_0.2-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My29201	S17-My29202	S17-My29203	S17-My29204
Date Sampled			May 26, 2017	May 26, 2017	May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	-
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	-
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	-
TRH C29-C36	50	mg/kg	55	< 50	< 50	-
TRH C10-36 (Total)	50	mg/kg	55	< 50	< 50	-
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	-
4-Bromofluorobenzene (surr.)	1	%	122	102	106	-
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.1-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.2-Dibromoethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.2-Dichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.2-Dichloropropane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.3-Dichloropropane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2-Butanone (MEK)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2-Propanone (Acetone)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
4-Chlorotoluene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Allyl chloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Bromobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Bromochloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Bromodichloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Bromoform	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Bromomethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Carbon disulfide	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Carbon Tetrachloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chloroform	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-

Client Sample ID			JHA06_1.0-1.2	JHA07_0.4-0.6	JHA07_1.3-1.5	JHA08_0.2-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My29201	S17-My29202	S17-My29203	S17-My29204
Date Sampled			May 26, 2017	May 26, 2017	May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit				
Volatile Organics						
Dibromochloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dibromomethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dichlorodifluoromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Iodomethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Methylene Chloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Styrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Tetrachloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Trichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Trichlorofluoromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Vinyl chloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	-
Fluorobenzene (surr.)	1	%	72	63	59	-
4-Bromofluorobenzene (surr.)	1	%	122	102	106	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	-
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	-
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	-
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	0.6	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	1.2	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chrysene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-

Client Sample ID			JHA06_1.0-1.2	JHA07_0.4-0.6	JHA07_1.3-1.5	JHA08_0.2-0.4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			S17-My29201	S17-My29202	S17-My29203	S17-My29204
Date Sampled			May 26, 2017	May 26, 2017	May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Total PAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	89	95	94	-
p-Terphenyl-d14 (surr.)	1	%	71	73	78	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
4.4'-DDD	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDE	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
4.4'-DDT	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
a-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Aldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
b-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
d-BHC	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Dieldrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan I	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan II	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endosulfan sulphate	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin aldehyde	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Endrin ketone	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
g-BHC (Lindane)	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Heptachlor epoxide	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Hexachlorobenzene	0.05	mg/kg	< 0.05	< 0.05	-	< 0.05
Methoxychlor	0.2	mg/kg	< 0.2	< 0.2	-	< 0.2
Toxaphene	1	mg/kg	< 1	< 1	-	< 1
Dibutylchlorendate (surr.)	1	%	103	90	-	97
Tetrachloro-m-xylene (surr.)	1	%	100	88	-	91
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1221	0.1	mg/kg	< 0.1	< 0.1	-	< 0.1
Aroclor-1232	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1242	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1248	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1254	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Aroclor-1260	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Total PCB*	0.5	mg/kg	< 0.5	< 0.5	-	< 0.5
Dibutylchlorendate (surr.)	1	%	103	90	-	97
Tetrachloro-m-xylene (surr.)	1	%	100	88	-	91
Phenolics (total)	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
% Moisture	1	%	16	8.8	25	11
Heavy Metals						
Arsenic	2	mg/kg	6.9	< 2	7.0	5.1
Cadmium	0.4	mg/kg	< 0.4	< 0.4	< 0.4	< 0.4
Chromium	5	mg/kg	11	< 5	11	13
Copper	5	mg/kg	17	< 5	19	15
Lead	5	mg/kg	27	< 5	12	28
Mercury	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Nickel	5	mg/kg	13	< 5	< 5	13
Zinc	5	mg/kg	50	14	18	310

Client Sample ID			JHA08_0.4-0.6	QC20170526-1
Sample Matrix			Soil	Soil
Eurofins | mgt Sample No.			S17-My29205	S17-My29213
Date Sampled			May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit		
Volatile Organics				
1.1-Dichloroethane	0.5	mg/kg	-	< 0.5
1.1-Dichloroethene	0.5	mg/kg	-	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	-	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	-	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5
1.2-Dibromoethane	0.5	mg/kg	-	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	-	< 0.5
1.2-Dichloroethane	0.5	mg/kg	-	< 0.5
1.2-Dichloropropane	0.5	mg/kg	-	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	-	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	-	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	-	< 0.5
1.3-Dichloropropane	0.5	mg/kg	-	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	-	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	-	< 0.5
2-Butanone (MEK)	0.5	mg/kg	-	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	-	< 0.5
4-Chlorotoluene	0.5	mg/kg	-	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	< 0.5
Allyl chloride	0.5	mg/kg	-	< 0.5
Benzene	0.1	mg/kg	-	< 0.1
Bromobenzene	0.5	mg/kg	-	< 0.5
Bromochloromethane	0.5	mg/kg	-	< 0.5
Bromodichloromethane	0.5	mg/kg	-	< 0.5
Bromoform	0.5	mg/kg	-	< 0.5
Bromomethane	0.5	mg/kg	-	< 0.5
Carbon disulfide	0.5	mg/kg	-	< 0.5
Carbon Tetrachloride	0.5	mg/kg	-	< 0.5
Chlorobenzene	0.5	mg/kg	-	< 0.5
Chloroethane	0.5	mg/kg	-	< 0.5
Chloroform	0.5	mg/kg	-	< 0.5
Chloromethane	0.5	mg/kg	-	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5
Dibromochloromethane	0.5	mg/kg	-	< 0.5
Dibromomethane	0.5	mg/kg	-	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	-	< 0.5
Ethylbenzene	0.1	mg/kg	-	< 0.1
Iodomethane	0.5	mg/kg	-	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	-	< 0.5
m&p-Xylenes	0.2	mg/kg	-	< 0.2
Methylene Chloride	0.5	mg/kg	-	< 0.5
o-Xylene	0.1	mg/kg	-	< 0.1
Styrene	0.5	mg/kg	-	< 0.5
Tetrachloroethene	0.5	mg/kg	-	< 0.5
Toluene	0.1	mg/kg	-	< 0.1
trans-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5

Client Sample ID			JHA08_0.4-0.6	QC20170526-1
Sample Matrix			Soil	Soil
Eurofins | mgt Sample No.			S17-My29205	S17-My29213
Date Sampled			May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit		
Volatile Organics				
Trichloroethene	0.5	mg/kg	-	< 0.5
Trichlorofluoromethane	0.5	mg/kg	-	< 0.5
Vinyl chloride	0.5	mg/kg	-	< 0.5
Xylenes - Total	0.3	mg/kg	-	< 0.3
Fluorobenzene (surr.)	1	%	-	59
4-Bromofluorobenzene (surr.)	1	%	-	104
% Moisture	1	%	9.8	23
Heavy Metals				
Arsenic	2	mg/kg	2.6	2.9
Cadmium	0.4	mg/kg	< 0.4	< 0.4
Chromium	5	mg/kg	5.9	8.0
Copper	5	mg/kg	8.4	9.8
Lead	5	mg/kg	8.2	8.3
Mercury	0.1	mg/kg	< 0.1	< 0.1
Nickel	5	mg/kg	< 5	< 5
Zinc	5	mg/kg	23	12

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jun 01, 2017	14 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	Jun 01, 2017	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 01, 2017	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 01, 2017	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	Jun 01, 2017	14 Days
- Method: LTM-ORG-2140 PAH and Phenols in Soils by GCMS			
Phenolics (total)	Melbourne	Jun 02, 2017	14 Day
- Method: APHA 5530B & D Phenols			
Metals M8	Sydney	Jun 01, 2017	28 Day
- Method: LTM-MET-3040_R0 TOTAL AND DISSOLVED METALS AND MERCURY IN WATERS BY ICP-MS			
Volatile Organics	Sydney	Jun 01, 2017	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Organochlorine Pesticides	Sydney	Jun 01, 2017	14 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Jun 01, 2017	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
% Moisture	Sydney	May 29, 2017	14 Day
- Method: LTM-GEN-7080 Moisture			

Document Set ID: 9547379
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Address: Level 1, 50 Margaret St
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Project Name: PENRITH DSI
Project ID: 52372

Order No.:
Report #: 548083
Phone: 02 8245 0300
Fax:

Received: May 29, 2017 1:50 PM
Due: Jun 5, 2017
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Metals M8 filtered	Phenols (IWRG 621)	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271																		X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 18217																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	JHA01_0.25-0.4	May 26, 2017		Soil	S17-My29193	X			X	X						X		X
2	JHA02_0.1-0.3	May 26, 2017		Soil	S17-My29194						X					X		
3	JHA02_0.3-0.5	May 26, 2017		Soil	S17-My29195	X										X		X
4	JHA04_0.2-0.4	May 26, 2017		Soil	S17-My29196	X									X	X		X
5	JHA04_0.6-0.8	May 26, 2017		Soil	S17-My29197						X				X	X		
6	JHA05_0-0.2	May 26, 2017		Soil	S17-My29198						X					X		
7	JHA06_0.2-0.4	May 26, 2017		Soil	S17-My29199						X					X		
8	JHA06_0.4-0.6	May 26, 2017		Soil	S17-My29200	X										X		X
9	JHA06_1.0-1.2	May 26, 2017		Soil	S17-My29201	X			X	X					X	X		X

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Melbourne Laboratory - NATA Site # 1254 & 14271																		X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 18217																		
10	JHA07_0.4-0.6	May 26, 2017		Soil	S17-My29202	X			X	X					X	X		X
11	JHA07_1.3-1.5	May 26, 2017		Soil	S17-My29203										X	X		X
12	JHA08_0.2-0.4	May 26, 2017		Soil	S17-My29204	X			X	X	X					X		
13	JHA08_0.4-0.6	May 26, 2017		Soil	S17-My29205						X					X		
14	PSM01	May 26, 2017		Water	S17-My29206							X		X	X		X	
15	PSM02	May 26, 2017		Water	S17-My29207							X		X	X		X	
16	PSM03	May 26, 2017		Water	S17-My29208							X		X	X		X	
17	RINS	May 26, 2017		Water	S17-My29209			X	X	X	X		X	X	X		X	
18	TS	May 26, 2017		Water	S17-My29210									X				
19	TB	May 26, 2017		Water	S17-My29211									X				
20	QC01_W	May 26, 2017		Water	S17-My29212							X		X	X		X	
21	QC20170526-	May 26, 2017		Soil	S17-My29213						X				X	X		

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Sample Detail						Asbestos - WA guidelines	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Metals M8 filtered	Phenols (IWRG 621)	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271																		X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 18217																		
	1																	
22	PSM01	May 26, 2017		Water (Trace)	S17-My29214			X										
23	PSM02	May 26, 2017		Water (Trace)	S17-My29215			X										
24	PSM03	May 26, 2017		Water (Trace)	S17-My29216			X										
25	QC01_W	May 26, 2017		Water (Trace)	S17-My29217			X										
26	JHA01_0.4-0.6	May 26, 2017		Soil	S17-My29219		X											
27	JHA03_0-0.2	May 26, 2017		Soil	S17-My29220		X											
28	JHA03_0.3-0.5	May 26, 2017		Soil	S17-My29221		X											
29	JHA04_0.4-0.6	May 26, 2017		Soil	S17-My29222		X											
30	JHA05_0.2-0.5	May 26, 2017		Soil	S17-My29223		X											
31	JHA06_0.8-1.0	May 26, 2017		Soil	S17-My29224		X											
32	JHA07_0.2-0.4	May 26, 2017		Soil	S17-My29225		X											

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Melbourne Laboratory - NATA Site # 1254 & 14271																		X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 18217																		
33	JHA07_0.8-1.0	May 26, 2017		Soil	S17-My29226		X											
Test Counts						7	8	5	5	5	8	4	1	7	11	14	5	7

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Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

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Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dibromoethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
2-Butanone (MEK)	mg/kg	< 0.5			0.5	Pass	
2-Propanone (Acetone)	mg/kg	< 0.5			0.5	Pass	
4-Chlorotoluene	mg/kg	< 0.5			0.5	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.5			0.5	Pass	
Allyl chloride	mg/kg	< 0.5			0.5	Pass	
Bromobenzene	mg/kg	< 0.5			0.5	Pass	
Bromochloromethane	mg/kg	< 0.5			0.5	Pass	
Bromodichloromethane	mg/kg	< 0.5			0.5	Pass	
Bromoform	mg/kg	< 0.5			0.5	Pass	
Bromomethane	mg/kg	< 0.5			0.5	Pass	
Carbon disulfide	mg/kg	< 0.5			0.5	Pass	
Carbon Tetrachloride	mg/kg	< 0.5			0.5	Pass	
Chlorobenzene	mg/kg	< 0.5			0.5	Pass	
Chloroethane	mg/kg	< 0.5			0.5	Pass	
Chloroform	mg/kg	< 0.5			0.5	Pass	
Chloromethane	mg/kg	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Dibromochloromethane	mg/kg	< 0.5			0.5	Pass	
Dibromomethane	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dichlorodifluoromethane	mg/kg	< 0.5			0.5	Pass	
Iodomethane	mg/kg	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	mg/kg	< 0.5			0.5	Pass	
Methylene Chloride	mg/kg	< 0.5			0.5	Pass	
Styrene	mg/kg	< 0.5			0.5	Pass	
Tetrachloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Trichloroethene	mg/kg	< 0.5			0.5	Pass	
Trichlorofluoromethane	mg/kg	< 0.5			0.5	Pass	
Vinyl chloride	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Phenolics (total)	mg/kg	< 0.1			0.1	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	94			70-130	Pass	
TRH C10-C14	%	114			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	81			70-130	Pass	
Toluene	%	88			70-130	Pass	
Ethylbenzene	%	94			70-130	Pass	
m&p-Xylenes	%	90			70-130	Pass	
o-Xylene	%	95			70-130	Pass	
Xylenes - Total	%	92			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethane	%	121			70-130	Pass	
1.1-Dichloroethene	%	105			70-130	Pass	
1.1.1-Trichloroethane	%	122			70-130	Pass	
1.1.1.2-Tetrachloroethane	%	122			70-130	Pass	
1.1.2-Trichloroethane	%	116			70-130	Pass	
1.1.2.2-Tetrachloroethane	%	100			70-130	Pass	
1.2-Dibromoethane	%	119			70-130	Pass	
1.2-Dichlorobenzene	%	119			70-130	Pass	
1.2-Dichloroethane	%	130			70-130	Pass	
1.2-Dichloropropane	%	103			70-130	Pass	
1.2.3-Trichloropropane	%	107			70-130	Pass	
1.2.4-Trimethylbenzene	%	114			70-130	Pass	
1.3-Dichlorobenzene	%	123			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.3-Dichloropropane	%	113			70-130	Pass	
1.3.5-Trimethylbenzene	%	114			70-130	Pass	
1.4-Dichlorobenzene	%	121			70-130	Pass	
2-Butanone (MEK)	%	90			70-130	Pass	
2-Propanone (Acetone)	%	75			70-130	Pass	
4-Chlorotoluene	%	115			70-130	Pass	
4-Methyl-2-pentanone (MIBK)	%	100			70-130	Pass	
Allyl chloride	%	129			70-130	Pass	
Bromobenzene	%	104			70-130	Pass	
Bromochloromethane	%	71			70-130	Pass	
Bromodichloromethane	%	123			70-130	Pass	
Bromoform	%	124			70-130	Pass	
Bromomethane	%	75			70-130	Pass	
Carbon disulfide	%	122			70-130	Pass	
Carbon Tetrachloride	%	129			70-130	Pass	
Chlorobenzene	%	117			70-130	Pass	
Chloroethane	%	70			70-130	Pass	
Chloroform	%	92			70-130	Pass	
Chloromethane	%	84			70-130	Pass	
cis-1.2-Dichloroethene	%	106			70-130	Pass	
cis-1.3-Dichloropropene	%	119			70-130	Pass	
Dibromochloromethane	%	129			70-130	Pass	
Dibromomethane	%	118			70-130	Pass	
Dichlorodifluoromethane	%	124			70-130	Pass	
Iodomethane	%	91			70-130	Pass	
Isopropyl benzene (Cumene)	%	116			70-130	Pass	
Methylene Chloride	%	116			70-130	Pass	
Styrene	%	114			70-130	Pass	
Tetrachloroethene	%	128			70-130	Pass	
trans-1.2-Dichloroethene	%	126			70-130	Pass	
trans-1.3-Dichloropropene	%	113			70-130	Pass	
Trichloroethene	%	126			70-130	Pass	
Trichlorofluoromethane	%	119			70-130	Pass	
Vinyl chloride	%	100			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	89			70-130	Pass	
TRH C6-C10	%	89			70-130	Pass	
TRH >C10-C16	%	120			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	90			70-130	Pass	
Acenaphthylene	%	94			70-130	Pass	
Anthracene	%	98			70-130	Pass	
Benz(a)anthracene	%	88			70-130	Pass	
Benzo(a)pyrene	%	102			70-130	Pass	
Benzo(b&j)fluoranthene	%	92			70-130	Pass	
Benzo(g.h.i)perylene	%	97			70-130	Pass	
Benzo(k)fluoranthene	%	106			70-130	Pass	
Chrysene	%	116			70-130	Pass	
Dibenz(a.h)anthracene	%	91			70-130	Pass	
Fluoranthene	%	102			70-130	Pass	
Fluorene	%	100			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	93			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Naphthalene	%	105			70-130	Pass	
Phenanthrene	%	100			70-130	Pass	
Pyrene	%	102			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	78			70-130	Pass	
4.4'-DDD	%	97			70-130	Pass	
4.4'-DDE	%	86			70-130	Pass	
4.4'-DDT	%	87			70-130	Pass	
a-BHC	%	85			70-130	Pass	
Aldrin	%	81			70-130	Pass	
b-BHC	%	71			70-130	Pass	
d-BHC	%	91			70-130	Pass	
Dieldrin	%	76			70-130	Pass	
Endosulfan I	%	76			70-130	Pass	
Endosulfan II	%	77			70-130	Pass	
Endosulfan sulphate	%	80			70-130	Pass	
Endrin	%	72			70-130	Pass	
Endrin aldehyde	%	74			70-130	Pass	
Endrin ketone	%	73			70-130	Pass	
g-BHC (Lindane)	%	70			70-130	Pass	
Heptachlor	%	86			70-130	Pass	
Heptachlor epoxide	%	82			70-130	Pass	
Hexachlorobenzene	%	71			70-130	Pass	
Methoxychlor	%	107			70-130	Pass	
Toxaphene	%	101			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1260	%	106			70-130	Pass	
LCS - % Recovery							
Phenolics (total)	%	101			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	83			70-130	Pass	
Cadmium	%	93			70-130	Pass	
Chromium	%	80			70-130	Pass	
Copper	%	83			70-130	Pass	
Lead	%	94			70-130	Pass	
Mercury	%	116			70-130	Pass	
Nickel	%	80			70-130	Pass	
Zinc	%	85			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S17-My26068	NCP	%	94			70-130	Pass	
Acenaphthylene	S17-My26068	NCP	%	103			70-130	Pass	
Anthracene	S17-My26068	NCP	%	97			70-130	Pass	
Benz(a)anthracene	S17-My26068	NCP	%	99			70-130	Pass	
Benzo(a)pyrene	S17-My26068	NCP	%	108			70-130	Pass	
Benzo(b&j)fluoranthene	S17-My26068	NCP	%	102			70-130	Pass	
Benzo(g.h.i)perylene	S17-My26068	NCP	%	111			70-130	Pass	
Benzo(k)fluoranthene	S17-My26068	NCP	%	99			70-130	Pass	
Chrysene	S17-My26068	NCP	%	115			70-130	Pass	
Dibenz(a.h)anthracene	S17-My26068	NCP	%	104			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fluoranthene	S17-My26068	NCP	%	114			70-130	Pass	
Fluorene	S17-My26068	NCP	%	109			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S17-My26068	NCP	%	115			70-130	Pass	
Naphthalene	S17-My26068	NCP	%	109			70-130	Pass	
Phenanthrene	S17-My26068	NCP	%	112			70-130	Pass	
Pyrene	S17-My26068	NCP	%	111			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
4.4'-DDT	S17-My28848	NCP	%	82			70-130	Pass	
Endrin	S17-My28848	NCP	%	102			70-130	Pass	
Endrin ketone	S17-My28848	NCP	%	98			70-130	Pass	
Hexachlorobenzene	S17-My29258	NCP	%	91			70-130	Pass	
Methoxychlor	S17-My28848	NCP	%	92			70-130	Pass	
Toxaphene	S17-My29258	NCP	%	108			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S17-My28850	NCP	%	84			70-130	Pass	
Copper	S17-My28850	NCP	%	90			70-130	Pass	
Lead	S17-My28850	NCP	%	90			70-130	Pass	
Zinc	S17-My28850	NCP	%	102			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Cadmium	S17-My29194	CP	%	81			70-130	Pass	
Chromium	S17-My29194	CP	%	80			70-130	Pass	
Mercury	S17-My29194	CP	%	81			70-130	Pass	
Nickel	S17-My29194	CP	%	84			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S17-My29195	CP	%	113			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	S17-My29195	CP	%	121			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethane	S17-My29122	NCP	%	93			70-130	Pass	
1.1-Dichloroethene	S17-My29122	NCP	%	102			70-130	Pass	
1.1.1-Trichloroethane	S17-My29122	NCP	%	129			70-130	Pass	
1.1.1.2-Tetrachloroethane	S17-My29122	NCP	%	103			70-130	Pass	
1.1.2-Trichloroethane	S17-My29122	NCP	%	115			70-130	Pass	
1.1.2.2-Tetrachloroethane	S17-My29122	NCP	%	87			70-130	Pass	
1.2-Dibromoethane	S17-My29122	NCP	%	116			70-130	Pass	
1.2-Dichlorobenzene	S17-My29122	NCP	%	115			70-130	Pass	
1.2-Dichloroethane	S17-My27249	NCP	%	123			70-130	Pass	
1.2-Dichloropropane	S17-My29122	NCP	%	96			70-130	Pass	
1.2.3-Trichloropropane	S17-My29122	NCP	%	113			70-130	Pass	
1.2.4-Trimethylbenzene	S17-My29122	NCP	%	101			70-130	Pass	
1.3-Dichlorobenzene	S17-My29122	NCP	%	114			70-130	Pass	
1.3-Dichloropropane	S17-My29122	NCP	%	112			70-130	Pass	
1.3.5-Trimethylbenzene	S17-My29122	NCP	%	99			70-130	Pass	
1.4-Dichlorobenzene	S17-My29122	NCP	%	111			70-130	Pass	
2-Butanone (MEK)	S17-My29122	NCP	%	74			70-130	Pass	
2-Propanone (Acetone)	S17-My29122	NCP	%	127			70-130	Pass	
4-Chlorotoluene	S17-My29122	NCP	%	103			70-130	Pass	
4-Methyl-2-pentanone (MIBK)	S17-My29122	NCP	%	110			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Allyl chloride	S17-My29122	NCP	%	82			70-130	Pass	
Bromobenzene	S17-My29122	NCP	%	96			70-130	Pass	
Bromochloromethane	S17-My29122	NCP	%	108			70-130	Pass	
Bromodichloromethane	S17-My29122	NCP	%	127			70-130	Pass	
Bromoform	S17-My29122	NCP	%	112			70-130	Pass	
Bromomethane	S17-My29122	NCP	%	78			70-130	Pass	
Carbon disulfide	S17-My27249	NCP	%	108			70-130	Pass	
Carbon Tetrachloride	S17-My29122	NCP	%	129			70-130	Pass	
Chlorobenzene	S17-My29122	NCP	%	89			70-130	Pass	
Chloroethane	S17-My27249	NCP	%	104			70-130	Pass	
Chloroform	S17-My29122	NCP	%	122			70-130	Pass	
Chloromethane	S17-My29122	NCP	%	78			70-130	Pass	
cis-1.2-Dichloroethene	S17-My29122	NCP	%	93			70-130	Pass	
cis-1.3-Dichloropropene	S17-My29122	NCP	%	127			70-130	Pass	
Dibromochloromethane	S17-My29122	NCP	%	126			70-130	Pass	
Dibromomethane	S17-My29122	NCP	%	121			70-130	Pass	
Dichlorodifluoromethane	S17-My29122	NCP	%	115			70-130	Pass	
Iodomethane	S17-My29122	NCP	%	81			70-130	Pass	
Isopropyl benzene (Cumene)	S17-My29122	NCP	%	95			70-130	Pass	
Methylene Chloride	S17-My29122	NCP	%	110			70-130	Pass	
Styrene	S17-My29122	NCP	%	92			70-130	Pass	
Tetrachloroethene	S17-My29122	NCP	%	127			70-130	Pass	
trans-1.2-Dichloroethene	S17-My29122	NCP	%	86			70-130	Pass	
trans-1.3-Dichloropropene	S17-My29122	NCP	%	110			70-130	Pass	
Trichloroethene	S17-My29122	NCP	%	115			70-130	Pass	
Trichlorofluoromethane	S17-My29122	NCP	%	113			70-130	Pass	
Vinyl chloride	S17-My29122	NCP	%	99			70-130	Pass	
Spike - % Recovery									
Organochlorine Pesticides				Result 1					
Chlordanes - Total	S17-My29201	CP	%	99			70-130	Pass	
4.4'-DDD	S17-My29201	CP	%	125			70-130	Pass	
4.4'-DDE	S17-My29201	CP	%	118			70-130	Pass	
a-BHC	S17-My29201	CP	%	103			70-130	Pass	
Aldrin	S17-My29201	CP	%	109			70-130	Pass	
b-BHC	S17-My29201	CP	%	80			70-130	Pass	
d-BHC	S17-My29201	CP	%	111			70-130	Pass	
Dieldrin	S17-My29201	CP	%	98			70-130	Pass	
Endosulfan I	S17-My29201	CP	%	95			70-130	Pass	
Endosulfan II	S17-My29201	CP	%	91			70-130	Pass	
Endosulfan sulphate	S17-My29201	CP	%	94			70-130	Pass	
Endrin aldehyde	S17-My29201	CP	%	93			70-130	Pass	
g-BHC (Lindane)	S17-My29201	CP	%	80			70-130	Pass	
Heptachlor	S17-My29201	CP	%	51			70-130	Fail	Q08
Heptachlor epoxide	S17-My29201	CP	%	130			70-130	Pass	
Spike - % Recovery									
Polychlorinated Biphenyls				Result 1					
Aroclor-1260	S17-My29201	CP	%	119			70-130	Pass	
Spike - % Recovery									
				Result 1					
Phenolics (total)	S17-My29201	CP	%	102			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S17-My29202	CP	%	90			70-130	Pass	
Spike - % Recovery									

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
BTEX				Result 1					
Benzene	S17-My29202	CP	%	77			70-130	Pass	
Toluene	S17-My29202	CP	%	84			70-130	Pass	
Ethylbenzene	S17-My29202	CP	%	93			70-130	Pass	
m&p-Xylenes	S17-My29202	CP	%	94			70-130	Pass	
o-Xylene	S17-My29202	CP	%	99			70-130	Pass	
Xylenes - Total	S17-My29202	CP	%	95			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S17-My29202	CP	%	96			70-130	Pass	
TRH C6-C10	S17-My29202	CP	%	86			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	S17-My29193	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S17-My29193	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	S17-My29193	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	S17-My29193	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S17-My29193	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S17-My29193	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S17-My29193	CP	mg/kg	< 0.5	0.6	38	30%	Fail	Q15
Benzo(g.h.i)perylene	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S17-My29193	CP	mg/kg	0.8	1.2	37	30%	Fail	Q15
Fluorene	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S17-My29193	CP	mg/kg	0.8	1.1	35	30%	Fail	Q15
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S17-My29193	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	

Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Endrin	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S17-My29193	CP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S17-My29193	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Toxaphene	S17-My29193	CP	mg/kg	< 1	< 1	<1	30%	Pass	
Duplicate									
Polychlorinated Biphenyls				Result 1	Result 2	RPD			
Aroclor-1016	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1221	S17-My29193	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Aroclor-1232	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1242	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1248	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1254	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Aroclor-1260	S17-My29193	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S17-Jn00513	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	S17-My28846	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S17-My28846	NCP	mg/kg	24	22	12	30%	Pass	
Copper	S17-My28846	NCP	mg/kg	22	24	9.0	30%	Pass	
Lead	S17-My28846	NCP	mg/kg	77	72	7.0	30%	Pass	
Mercury	S17-My28846	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S17-My28846	NCP	mg/kg	6.9	6.3	9.0	30%	Pass	
Zinc	S17-My28846	NCP	mg/kg	66	62	7.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Phenolics (total)	S17-My29200	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S17-My29201	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S17-My29201	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S17-My29201	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S17-My29201	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S17-My29201	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S17-My29201	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total	S17-My29201	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1-Dichloroethene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1-Trichloroethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2-Trichloroethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dibromoethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichlorobenzene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloroethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloropropane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.2.3-Trichloropropane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trimethylbenzene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichlorobenzene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichloropropane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3.5-Trimethylbenzene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.4-Dichlorobenzene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Butanone (MEK)	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Propanone (Acetone)	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chlorotoluene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Allyl chloride	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromobenzene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromochloromethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromodichloromethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromoform	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromomethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon disulfide	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon Tetrachloride	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chlorobenzene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroform	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloromethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.2-Dichloroethene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.3-Dichloropropene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromochloromethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromomethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorodifluoromethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Iodomethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Isopropyl benzene (Cumene)	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Methylene Chloride	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Styrene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Tetrachloroethene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.2-Dichloroethene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.3-Dichloropropene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichloroethene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichlorofluoromethane	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Vinyl chloride	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S17-My29201	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S17-My29201	CP	mg/kg	< 20	< 20	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S17-My29201	CP	%	16	17	8.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Nibha Vaidya	Analytical Services Manager
Huong Le	Senior Analyst-Inorganic (VIC)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)
Ryan Hamilton	Senior Analyst-Inorganic (NSW)
Ryan Hamilton	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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eurofins | mgt

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **548083-W**
Project name PENRITH DSI
Project ID 52372
Received Date May 29, 2017

Client Sample ID			**PSM01**	**PSM02**	**PSM03**	**RINS**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S17-My29206**	**S17-My29207**	**S17-My29208**	**S17-My29209**
Date Sampled			**May 26, 2017**	**May 26, 2017**	**May 26, 2017**	**May 26, 2017**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	0.15	0.05	0.04	< 0.02
TRH C10-C14	0.05	mg/L	< 0.05	0.74	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	1.1	1.9	0.2	< 0.1
TRH C29-C36	0.1	mg/L	0.1	< 0.1	< 0.1	< 0.1
TRH C10-36 (Total)	0.1	mg/L	1.2	2.64	0.2	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	0.073	0.021	0.021	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	0.002	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	0.004	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	89	91	95	92
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	0.003	< 0.001	< 0.001
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	0.001	< 0.001	< 0.001
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Butanone (MEK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Propanone (Acetone)	0.001	mg/L	0.021	< 0.001	< 0.001	< 0.001
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Client Sample ID			PSM01	PSM02	PSM03	RINS
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			S17-My29206	S17-My29207	S17-My29208	S17-My29209
Date Sampled			May 26, 2017	May 26, 2017	May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit				
Volatile Organics						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromodichloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromoform	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chloroform	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Chloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dichlorodifluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Iodomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	0.002	< 0.002	< 0.002
Methylene Chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
o-Xylene	0.001	mg/L	< 0.001	0.002	< 0.001	< 0.001
Styrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Tetrachloroethene	0.001	mg/L	0.059	< 0.001	0.007	< 0.001
Toluene	0.001	mg/L	0.073	0.021	0.021	< 0.001
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichlorofluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	0.004	< 0.003	< 0.003
Fluorobenzene (surr.)	1	%	68	71	71	67
4-Bromofluorobenzene (surr.)	1	%	89	91	95	92
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	0.08	0.04	0.03	< 0.02
TRH C6-C10	0.02	mg/L	0.15	0.06	0.05	< 0.02
TRH >C10-C16	0.05	mg/L	< 0.05	1.6	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	1.2	1.0	0.2	< 0.1
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	1.6	< 0.05	< 0.05
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	-	-	-	< 0.001
Acenaphthylene	0.001	mg/L	-	-	-	< 0.001
Anthracene	0.001	mg/L	-	-	-	< 0.001
Benz(a)anthracene	0.001	mg/L	-	-	-	< 0.001
Benzo(a)pyrene	0.001	mg/L	-	-	-	< 0.001

Client Sample ID			PSM01	PSM02	PSM03	RINS
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			S17-My29206	S17-My29207	S17-My29208	S17-My29209
Date Sampled			May 26, 2017	May 26, 2017	May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	-	-	-	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	-	-	-	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	-	-	-	< 0.001
Chrysene	0.001	mg/L	-	-	-	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	-	-	-	< 0.001
Fluoranthene	0.001	mg/L	-	-	-	< 0.001
Fluorene	0.001	mg/L	-	-	-	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	-	-	-	< 0.001
Naphthalene	0.001	mg/L	-	-	-	< 0.001
Phenanthrene	0.001	mg/L	-	-	-	< 0.001
Pyrene	0.001	mg/L	-	-	-	< 0.001
Total PAH*	0.001	mg/L	-	-	-	< 0.001
2-Fluorobiphenyl (surr.)	1	%	-	-	-	INT
p-Terphenyl-d14 (surr.)	1	%	-	-	-	INT
Organochlorine Pesticides						
Chlordanes - Total	0.001	mg/L	-	-	-	< 0.001
4.4'-DDD	0.0001	mg/L	-	-	-	< 0.0001
4.4'-DDE	0.0001	mg/L	-	-	-	< 0.0001
4.4'-DDT	0.0001	mg/L	-	-	-	< 0.0001
a-BHC	0.0001	mg/L	-	-	-	< 0.0001
Aldrin	0.0001	mg/L	-	-	-	< 0.0001
b-BHC	0.0001	mg/L	-	-	-	< 0.0001
d-BHC	0.0001	mg/L	-	-	-	< 0.0001
Dieldrin	0.0001	mg/L	-	-	-	< 0.0001
Endosulfan I	0.0001	mg/L	-	-	-	< 0.0001
Endosulfan II	0.0001	mg/L	-	-	-	< 0.0001
Endosulfan sulphate	0.0001	mg/L	-	-	-	< 0.0001
Endrin	0.0001	mg/L	-	-	-	< 0.0001
Endrin aldehyde	0.0001	mg/L	-	-	-	< 0.0001
Endrin ketone	0.0001	mg/L	-	-	-	< 0.0001
g-BHC (Lindane)	0.0001	mg/L	-	-	-	< 0.0001
Heptachlor	0.0001	mg/L	-	-	-	< 0.0001
Heptachlor epoxide	0.0001	mg/L	-	-	-	< 0.0001
Hexachlorobenzene	0.0001	mg/L	-	-	-	< 0.0001
Methoxychlor	0.0001	mg/L	-	-	-	< 0.0001
Toxaphene	0.01	mg/L	-	-	-	< 0.01
Dibutylchlorendate (surr.)	1	%	-	-	-	75
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	62
Polychlorinated Biphenyls						
Aroclor-1016	0.005	mg/L	-	-	-	< 0.005
Aroclor-1221	0.001	mg/L	-	-	-	< 0.001
Aroclor-1232	0.005	mg/L	-	-	-	< 0.005
Aroclor-1242	0.005	mg/L	-	-	-	< 0.005
Aroclor-1248	0.005	mg/L	-	-	-	< 0.005
Aroclor-1254	0.005	mg/L	-	-	-	< 0.005
Aroclor-1260	0.005	mg/L	-	-	-	< 0.005
Total PCB*	0.001	mg/L	-	-	-	< 0.001
Dibutylchlorendate (surr.)	1	%	-	-	-	75
Tetrachloro-m-xylene (surr.)	1	%	-	-	-	62

Client Sample ID			PSM01	PSM02	PSM03	RINS
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			S17-My29206	S17-My29207	S17-My29208	S17-My29209
Date Sampled			May 26, 2017	May 26, 2017	May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit				
Phenols (Halogenated)						
2-Chlorophenol	0.003	mg/L	-	-	-	< 0.003
2.4-Dichlorophenol	0.001	mg/L	-	-	-	< 0.001
2.4.5-Trichlorophenol	0.001	mg/L	-	-	-	< 0.001
2.4.6-Trichlorophenol	0.01	mg/L	-	-	-	< 0.01
2.6-Dichlorophenol	0.003	mg/L	-	-	-	< 0.003
4-Chloro-3-methylphenol	0.01	mg/L	-	-	-	< 0.01
Pentachlorophenol	0.01	mg/L	-	-	-	< 0.01
Tetrachlorophenols - Total	0.03	mg/L	-	-	-	< 0.03
Total Halogenated Phenol*	0.01	mg/L	-	-	-	< 0.01
Phenols (non-Halogenated)						
2-Cyclohexyl-4.6-dinitrophenol	0.1	mg/L	-	-	-	< 0.1
2-Methyl-4.6-dinitrophenol	0.005	mg/L	-	-	-	< 0.005
2-Methylphenol (o-Cresol)	0.003	mg/L	-	-	-	< 0.003
2-Nitrophenol	0.005	mg/L	-	-	-	< 0.005
2.4-Dimethylphenol	0.001	mg/L	-	-	-	< 0.001
2.4-Dinitrophenol	0.001	mg/L	-	-	-	< 0.001
3&4-Methylphenol (m&p-Cresol)	0.006	mg/L	-	-	-	< 0.006
4-Nitrophenol	0.001	mg/L	-	-	-	0.003
Dinoseb	0.1	mg/L	-	-	-	< 0.1
Phenol	0.003	mg/L	-	-	-	< 0.003
Total Non-Halogenated Phenol*	0.1	mg/L	-	-	-	< 0.1
Phenol-d6 (surr.)	1	%	-	-	-	INT
Heavy Metals						
Arsenic	0.001	mg/L	-	-	-	< 0.001
Arsenic (filtered)	0.001	mg/L	0.001	0.001	0.003	-
Cadmium	0.0002	mg/L	-	-	-	< 0.0002
Cadmium (filtered)	0.0002	mg/L	< 0.0002	< 0.0002	< 0.0002	-
Chromium	0.001	mg/L	-	-	-	0.001
Chromium (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Copper	0.001	mg/L	-	-	-	< 0.001
Copper (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Lead	0.001	mg/L	-	-	-	< 0.001
Lead (filtered)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Mercury	0.0001	mg/L	-	-	-	< 0.0001
Mercury (filtered)	0.0001	mg/L	0.0002	0.0002	< 0.0001	-
Nickel	0.001	mg/L	-	-	-	< 0.001
Nickel (filtered)	0.001	mg/L	0.004	0.006	< 0.001	-
Zinc	0.005	mg/L	-	-	-	< 0.005
Zinc (filtered)	0.005	mg/L	< 0.005	< 0.005	< 0.005	-

Client Sample ID			TS	TB	QC01_W	PSM01
Sample Matrix			Water	Water	Water	Water (Trace)
Eurofins | mgt Sample No.			S17-My29210	S17-My29211	S17-My29212	S17-My29214
Date Sampled			May 26, 2017	May 26, 2017	May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	-	-	0.15	-
TRH C10-C14	0.05	mg/L	-	-	< 0.05	-
TRH C15-C28	0.1	mg/L	-	-	0.4	-
TRH C29-C36	0.1	mg/L	-	-	< 0.1	-
TRH C10-36 (Total)	0.1	mg/L	-	-	0.4	-
BTEX						
Benzene	0.001	mg/L	111%	< 0.001	< 0.001	-
Toluene	0.001	mg/L	98%	< 0.001	0.072	-
Ethylbenzene	0.001	mg/L	92%	< 0.001	< 0.001	-
m&p-Xylenes	0.002	mg/L	102%	< 0.002	< 0.002	-
o-Xylene	0.001	mg/L	103%	< 0.001	< 0.001	-
Xylenes - Total	0.003	mg/L	103%	< 0.003	< 0.003	-
4-Bromofluorobenzene (surr.)	1	%	99	94	92	-
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	-	-	< 0.001	-
1.1-Dichloroethene	0.001	mg/L	-	-	< 0.001	-
1.1.1-Trichloroethane	0.001	mg/L	-	-	< 0.001	-
1.1.1.2-Tetrachloroethane	0.001	mg/L	-	-	< 0.001	-
1.1.2-Trichloroethane	0.001	mg/L	-	-	< 0.001	-
1.1.2.2-Tetrachloroethane	0.001	mg/L	-	-	< 0.001	-
1.2-Dibromoethane	0.001	mg/L	-	-	< 0.001	-
1.2-Dichlorobenzene	0.001	mg/L	-	-	< 0.001	-
1.2-Dichloroethane	0.001	mg/L	-	-	< 0.001	-
1.2-Dichloropropane	0.001	mg/L	-	-	< 0.001	-
1.2.3-Trichloropropane	0.001	mg/L	-	-	< 0.001	-
1.2.4-Trimethylbenzene	0.001	mg/L	-	-	< 0.001	-
1.3-Dichlorobenzene	0.001	mg/L	-	-	< 0.001	-
1.3-Dichloropropane	0.001	mg/L	-	-	< 0.001	-
1.3.5-Trimethylbenzene	0.001	mg/L	-	-	< 0.001	-
1.4-Dichlorobenzene	0.001	mg/L	-	-	< 0.001	-
2-Butanone (MEK)	0.001	mg/L	-	-	< 0.001	-
2-Propanone (Acetone)	0.001	mg/L	-	-	0.021	-
4-Chlorotoluene	0.001	mg/L	-	-	< 0.001	-
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	-	-	< 0.001	-
Allyl chloride	0.001	mg/L	-	-	< 0.001	-
Benzene	0.001	mg/L	-	-	< 0.001	-
Bromobenzene	0.001	mg/L	-	-	< 0.001	-
Bromochloromethane	0.001	mg/L	-	-	< 0.001	-
Bromodichloromethane	0.001	mg/L	-	-	< 0.001	-
Bromoform	0.001	mg/L	-	-	< 0.001	-
Bromomethane	0.001	mg/L	-	-	< 0.001	-
Carbon disulfide	0.001	mg/L	-	-	< 0.001	-
Carbon Tetrachloride	0.001	mg/L	-	-	< 0.001	-
Chlorobenzene	0.001	mg/L	-	-	< 0.001	-
Chloroethane	0.001	mg/L	-	-	< 0.001	-
Chloroform	0.005	mg/L	-	-	< 0.005	-
Chloromethane	0.001	mg/L	-	-	< 0.001	-
cis-1.2-Dichloroethene	0.001	mg/L	-	-	< 0.001	-
cis-1.3-Dichloropropene	0.001	mg/L	-	-	< 0.001	-

Client Sample ID			TS	TB	QC01_W	PSM01
Sample Matrix			Water	Water	Water	Water (Trace)
Eurofins | mgt Sample No.			S17-My29210	S17-My29211	S17-My29212	S17-My29214
Date Sampled			May 26, 2017	May 26, 2017	May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit				
Volatile Organics						
Dibromochloromethane	0.001	mg/L	-	-	< 0.001	-
Dibromomethane	0.001	mg/L	-	-	< 0.001	-
Dichlorodifluoromethane	0.001	mg/L	-	-	< 0.001	-
Ethylbenzene	0.001	mg/L	-	-	< 0.001	-
Iodomethane	0.001	mg/L	-	-	< 0.001	-
Isopropyl benzene (Cumene)	0.001	mg/L	-	-	< 0.001	-
m&p-Xylenes	0.002	mg/L	-	-	< 0.002	-
Methylene Chloride	0.001	mg/L	-	-	< 0.001	-
o-Xylene	0.001	mg/L	-	-	< 0.001	-
Styrene	0.001	mg/L	-	-	< 0.001	-
Tetrachloroethene	0.001	mg/L	-	-	0.051	-
Toluene	0.001	mg/L	-	-	0.072	-
trans-1.2-Dichloroethene	0.001	mg/L	-	-	< 0.001	-
trans-1.3-Dichloropropene	0.001	mg/L	-	-	< 0.001	-
Trichloroethene	0.001	mg/L	-	-	< 0.001	-
Trichlorofluoromethane	0.001	mg/L	-	-	< 0.001	-
Vinyl chloride	0.001	mg/L	-	-	< 0.001	-
Xylenes - Total	0.003	mg/L	-	-	< 0.003	-
Fluorobenzene (surr.)	1	%	-	-	69	-
4-Bromofluorobenzene (surr.)	1	%	-	-	92	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	-	-	< 0.01	-
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	-	-	0.08	-
TRH C6-C10	0.02	mg/L	-	-	0.15	-
TRH >C10-C16	0.05	mg/L	-	-	< 0.05	-
TRH >C16-C34	0.1	mg/L	-	-	0.4	-
TRH >C34-C40	0.1	mg/L	-	-	< 0.1	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	-	-	< 0.05	-
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.00005	mg/L	-	-	-	< 0.00005
Acenaphthylene	0.00005	mg/L	-	-	-	< 0.00005
Anthracene	0.00005	mg/L	-	-	-	< 0.00005
Benz(a)anthracene	0.00005	mg/L	-	-	-	< 0.00005
Benzo(a)pyrene	0.00001	mg/L	-	-	-	< 0.00001
Benzo(b&j)fluoranthene[N07]	0.00005	mg/L	-	-	-	< 0.00005
Benzo(g.h.i)perylene	0.00005	mg/L	-	-	-	< 0.00005
Benzo(k)fluoranthene	0.00005	mg/L	-	-	-	< 0.00005
Chrysene	0.00005	mg/L	-	-	-	< 0.00005
Dibenz(a.h)anthracene	0.00005	mg/L	-	-	-	< 0.00005
Fluoranthene	0.00005	mg/L	-	-	-	< 0.00005
Fluorene	0.00005	mg/L	-	-	-	< 0.00005
Indeno(1.2.3-cd)pyrene	0.00005	mg/L	-	-	-	< 0.00005
Naphthalene	0.00005	mg/L	-	-	-	0.00014
Phenanthrene	0.00005	mg/L	-	-	-	0.00008
Pyrene	0.00005	mg/L	-	-	-	< 0.00005
Total PAH*	0.00005	mg/L	-	-	-	0.00022
2-Fluorobiphenyl (surr.)	1	%	-	-	-	67
p-Terphenyl-d14 (surr.)	1	%	-	-	-	76

Client Sample ID			TS	TB	QC01_W	PSM01
Sample Matrix			Water	Water	Water	Water (Trace)
Eurofins | mgt Sample No.			S17-My29210	S17-My29211	S17-My29212	S17-My29214
Date Sampled			May 26, 2017	May 26, 2017	May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic (filtered)	0.001	mg/L	-	-	< 0.001	-
Cadmium (filtered)	0.0002	mg/L	-	-	< 0.0002	-
Chromium (filtered)	0.001	mg/L	-	-	0.001	-
Copper (filtered)	0.001	mg/L	-	-	< 0.001	-
Lead (filtered)	0.001	mg/L	-	-	< 0.001	-
Mercury (filtered)	0.0001	mg/L	-	-	< 0.0001	-
Nickel (filtered)	0.001	mg/L	-	-	0.004	-
Zinc (filtered)	0.005	mg/L	-	-	< 0.005	-

Client Sample ID			PSM02	PSM03	QC01_W
Sample Matrix			Water (Trace)	Water (Trace)	Water (Trace)
Eurofins | mgt Sample No.			S17-My29215	S17-My29216	S17-My29217
Date Sampled			May 26, 2017	May 26, 2017	May 26, 2017
Test/Reference	LOR	Unit			
Polycyclic Aromatic Hydrocarbons					
Acenaphthene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005
Acenaphthylene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005
Anthracene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005
Benz(a)anthracene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005
Benzo(a)pyrene	0.00001	mg/L	0.00001	< 0.00001	0.00001
Benzo(b&j)fluoranthene[N07]	0.00005	mg/L	0.00005	< 0.00005	< 0.00005
Benzo(g.h.i)perylene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005
Benzo(k)fluoranthene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005
Chrysene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005
Dibenz(a.h)anthracene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005
Fluoranthene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005
Fluorene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005
Indeno(1.2.3-cd)pyrene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005
Naphthalene	0.00005	mg/L	0.00014	0.00009	0.00020
Phenanthrene	0.00005	mg/L	0.00007	< 0.00005	0.00005
Pyrene	0.00005	mg/L	< 0.00005	< 0.00005	< 0.00005
Total PAH*	0.00005	mg/L	0.00027	9E-05	0.00026
2-Fluorobiphenyl (surr.)	1	%	67	68	63
p-Terphenyl-d14 (surr.)	1	%	92	95	94

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	May 31, 2017	7 Day
- Method: TRH C6-C36 - LTM-ORG-2010			
BTEX	Sydney	May 29, 2017	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 29, 2017	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	May 31, 2017	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Polycyclic Aromatic Hydrocarbons	Sydney	May 31, 2017	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Water by GCMS			
Metals M8	Sydney	May 29, 2017	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			
Volatile Organics	Sydney	May 29, 2017	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Organochlorine Pesticides	Sydney	May 31, 2017	7 Day
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	May 31, 2017	7 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Metals M8 filtered	Sydney	May 29, 2017	28 Day
- Method: LTM-MET-3040 Metals in Waters by ICP-MS			
Phenols (Halogenated)	Sydney	May 31, 2017	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Water by GCMS			
Phenols (non-Halogenated)	Sydney	May 31, 2017	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Water by GCMS			

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Project Name: PENRITH DSI
Project ID: 52372

Order No.:
Report #: 548083
Phone: 02 8245 0300
Fax:

Received: May 29, 2017 1:50 PM
Due: Jun 5, 2017
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Metals M8 filtered	Phenols (IWRG 621)	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271																		X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 18217																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	JHA01_0.25-0.4	May 26, 2017		Soil	S17-My29193	X			X	X						X		X
2	JHA02_0.1-0.3	May 26, 2017		Soil	S17-My29194						X					X		
3	JHA02_0.3-0.5	May 26, 2017		Soil	S17-My29195	X										X		X
4	JHA04_0.2-0.4	May 26, 2017		Soil	S17-My29196	X									X	X		X
5	JHA04_0.6-0.8	May 26, 2017		Soil	S17-My29197						X				X	X		
6	JHA05_0-0.2	May 26, 2017		Soil	S17-My29198						X					X		
7	JHA06_0.2-0.4	May 26, 2017		Soil	S17-My29199						X					X		
8	JHA06_0.4-0.6	May 26, 2017		Soil	S17-My29200	X										X		X
9	JHA06_1.0-1.2	May 26, 2017		Soil	S17-My29201	X			X	X					X	X		X

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Project Name: PENRITH DSI
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Order No.:
Report #: 548083
Phone: 02 8245 0300
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Received: May 29, 2017 1:50 PM
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Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Metals M8 filtered	Phenols (IWRG 621)	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271																		X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 18217																		
10	JHA07_0.4-0.6	May 26, 2017		Soil	S17-My29202	X			X	X					X	X		X
11	JHA07_1.3-1.5	May 26, 2017		Soil	S17-My29203										X	X		X
12	JHA08_0.2-0.4	May 26, 2017		Soil	S17-My29204	X			X	X	X					X		
13	JHA08_0.4-0.6	May 26, 2017		Soil	S17-My29205						X					X		
14	PSM01	May 26, 2017		Water	S17-My29206							X		X	X		X	
15	PSM02	May 26, 2017		Water	S17-My29207							X		X	X		X	
16	PSM03	May 26, 2017		Water	S17-My29208							X		X	X		X	
17	RINS	May 26, 2017		Water	S17-My29209			X	X	X	X		X	X	X		X	
18	TS	May 26, 2017		Water	S17-My29210									X				
19	TB	May 26, 2017		Water	S17-My29211									X				
20	QC01_W	May 26, 2017		Water	S17-My29212							X		X	X		X	
21	QC20170526-	May 26, 2017		Soil	S17-My29213						X				X	X		

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH DSI
Project ID: 52372

Order No.:
Report #: 548083
Phone: 02 8245 0300
Fax:

Received: May 29, 2017 1:50 PM
Due: Jun 5, 2017
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Asbestos - WA guidelines	HOLD	Polycyclic Aromatic Hydrocarbons	Organochlorine Pesticides	Polychlorinated Biphenyls	Metals M8	Metals M8 filtered	Phenols (IWRG 621)	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons	JBS&G Suite 1
Melbourne Laboratory - NATA Site # 1254 & 14271																		X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 18217																		
	1																	
22	PSM01	May 26, 2017		Water (Trace)	S17-My29214			X										
23	PSM02	May 26, 2017		Water (Trace)	S17-My29215			X										
24	PSM03	May 26, 2017		Water (Trace)	S17-My29216			X										
25	QC01_W	May 26, 2017		Water (Trace)	S17-My29217			X										
26	JHA01_0.4-0.6	May 26, 2017		Soil	S17-My29219		X											
27	JHA03_0-0.2	May 26, 2017		Soil	S17-My29220		X											
28	JHA03_0.3-0.5	May 26, 2017		Soil	S17-My29221		X											
29	JHA04_0.4-0.6	May 26, 2017		Soil	S17-My29222		X											
30	JHA05_0.2-0.5	May 26, 2017		Soil	S17-My29223		X											
31	JHA06_0.8-1.0	May 26, 2017		Soil	S17-My29224		X											
32	JHA07_0.2-0.4	May 26, 2017		Soil	S17-My29225		X											

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Melbourne Laboratory - NATA Site # 1254 & 14271																		X
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 18217																		
33	JHA07_0.8-1.0	May 26, 2017		Soil	S17-My29226		X											
Test Counts						7	8	5	5	5	8	4	1	7	11	14	5	7

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/L	< 0.001			0.001	Pass	
4.4'-DDD	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDE	mg/L	< 0.0001			0.0001	Pass	
4.4'-DDT	mg/L	< 0.0001			0.0001	Pass	
a-BHC	mg/L	< 0.0001			0.0001	Pass	
Aldrin	mg/L	< 0.0001			0.0001	Pass	
b-BHC	mg/L	< 0.0001			0.0001	Pass	
d-BHC	mg/L	< 0.0001			0.0001	Pass	
Dieldrin	mg/L	< 0.0001			0.0001	Pass	
Endosulfan I	mg/L	< 0.0001			0.0001	Pass	
Endosulfan II	mg/L	< 0.0001			0.0001	Pass	
Endosulfan sulphate	mg/L	< 0.0001			0.0001	Pass	
Endrin	mg/L	< 0.0001			0.0001	Pass	
Endrin aldehyde	mg/L	< 0.0001			0.0001	Pass	
Endrin ketone	mg/L	< 0.0001			0.0001	Pass	
g-BHC (Lindane)	mg/L	< 0.0001			0.0001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Heptachlor	mg/L	< 0.0001			0.0001	Pass	
Heptachlor epoxide	mg/L	< 0.0001			0.0001	Pass	
Hexachlorobenzene	mg/L	< 0.0001			0.0001	Pass	
Methoxychlor	mg/L	< 0.0001			0.0001	Pass	
Toxaphene	mg/L	< 0.01			0.01	Pass	
Method Blank							
Phenols (Halogenated)							
2-Chlorophenol	mg/L	< 0.003			0.003	Pass	
2.4-Dichlorophenol	mg/L	< 0.001			0.001	Pass	
2.4.5-Trichlorophenol	mg/L	< 0.001			0.001	Pass	
2.4.6-Trichlorophenol	mg/L	< 0.01			0.01	Pass	
2.6-Dichlorophenol	mg/L	< 0.003			0.003	Pass	
4-Chloro-3-methylphenol	mg/L	< 0.01			0.01	Pass	
Pentachlorophenol	mg/L	< 0.01			0.01	Pass	
Tetrachlorophenols - Total	mg/L	< 0.03			0.03	Pass	
Method Blank							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	mg/L	< 0.1			0.1	Pass	
2-Methyl-4.6-dinitrophenol	mg/L	< 0.005			0.005	Pass	
2-Methylphenol (o-Cresol)	mg/L	< 0.003			0.003	Pass	
2-Nitrophenol	mg/L	< 0.005			0.005	Pass	
2.4-Dimethylphenol	mg/L	< 0.001			0.001	Pass	
2.4-Dinitrophenol	mg/L	< 0.001			0.001	Pass	
3&4-Methylphenol (m&p-Cresol)	mg/L	< 0.006			0.006	Pass	
4-Nitrophenol	mg/L	0.001			0.001	Pass	
Dinoseb	mg/L	< 0.1			0.1	Pass	
Phenol	mg/L	< 0.003			0.003	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Arsenic (filtered)	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Chromium (filtered)	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Copper (filtered)	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Lead (filtered)	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Mercury (filtered)	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Nickel (filtered)	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	101			70-130	Pass	
TRH C10-C14	%	94			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	103			70-130	Pass	
Toluene	%	94			70-130	Pass	
Ethylbenzene	%	89			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
m&p-Xylenes	%	99			70-130	Pass	
o-Xylene	%	99			70-130	Pass	
Xylenes - Total	%	99			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethane	%	95			70-130	Pass	
1.1-Dichloroethene	%	101			70-130	Pass	
1.1.1-Trichloroethane	%	103			70-130	Pass	
1.1.1.2-Tetrachloroethane	%	98			70-130	Pass	
1.1.2-Trichloroethane	%	95			70-130	Pass	
1.1.2.2-Tetrachloroethane	%	90			70-130	Pass	
1.2-Dibromoethane	%	96			70-130	Pass	
1.2-Dichlorobenzene	%	97			70-130	Pass	
1.2-Dichloroethane	%	91			70-130	Pass	
1.2-Dichloropropane	%	88			70-130	Pass	
1.2.3-Trichloropropane	%	93			70-130	Pass	
1.2.4-Trimethylbenzene	%	97			70-130	Pass	
1.3-Dichlorobenzene	%	99			70-130	Pass	
1.3-Dichloropropane	%	91			70-130	Pass	
1.3.5-Trimethylbenzene	%	97			70-130	Pass	
1.4-Dichlorobenzene	%	99			70-130	Pass	
2-Butanone (MEK)	%	97			70-130	Pass	
2-Propanone (Acetone)	%	87			70-130	Pass	
4-Chlorotoluene	%	97			70-130	Pass	
4-Methyl-2-pentanone (MIBK)	%	91			70-130	Pass	
Allyl chloride	%	96			70-130	Pass	
Bromobenzene	%	90			70-130	Pass	
Bromochloromethane	%	90			70-130	Pass	
Bromodichloromethane	%	96			70-130	Pass	
Bromoform	%	98			70-130	Pass	
Bromomethane	%	101			70-130	Pass	
Carbon disulfide	%	100			70-130	Pass	
Carbon Tetrachloride	%	115			70-130	Pass	
Chlorobenzene	%	97			70-130	Pass	
Chloroethane	%	92			70-130	Pass	
Chloroform	%	98			70-130	Pass	
Chloromethane	%	89			70-130	Pass	
cis-1.2-Dichloroethene	%	94			70-130	Pass	
cis-1.3-Dichloropropene	%	96			70-130	Pass	
Dibromochloromethane	%	100			70-130	Pass	
Dibromomethane	%	95			70-130	Pass	
Dichlorodifluoromethane	%	105			70-130	Pass	
Iodomethane	%	118			70-130	Pass	
Isopropyl benzene (Cumene)	%	99			70-130	Pass	
Methylene Chloride	%	97			70-130	Pass	
Styrene	%	94			70-130	Pass	
Tetrachloroethene	%	107			70-130	Pass	
trans-1.2-Dichloroethene	%	96			70-130	Pass	
trans-1.3-Dichloropropene	%	93			70-130	Pass	
Trichloroethene	%	100			70-130	Pass	
Trichlorofluoromethane	%	112			70-130	Pass	
Vinyl chloride	%	105			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Naphthalene	%	89			70-130	Pass	
TRH C6-C10	%	99			70-130	Pass	
TRH >C10-C16	%	107			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	91			70-130	Pass	
Acenaphthylene	%	93			70-130	Pass	
Anthracene	%	117			70-130	Pass	
Benz(a)anthracene	%	127			70-130	Pass	
Benzo(a)pyrene	%	109			70-130	Pass	
Benzo(b&j)fluoranthene	%	99			70-130	Pass	
Benzo(g.h.i)perylene	%	108			70-130	Pass	
Benzo(k)fluoranthene	%	118			70-130	Pass	
Chrysene	%	114			70-130	Pass	
Dibenz(a.h)anthracene	%	123			70-130	Pass	
Fluoranthene	%	117			70-130	Pass	
Fluorene	%	101			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	125			70-130	Pass	
Naphthalene	%	87			70-130	Pass	
Phenanthrene	%	110			70-130	Pass	
Pyrene	%	116			70-130	Pass	
LCS - % Recovery							
Phenols (Halogenated)							
2-Chlorophenol	%	71			30-130	Pass	
2.4-Dichlorophenol	%	96			30-130	Pass	
2.4.5-Trichlorophenol	%	107			30-130	Pass	
2.4.6-Trichlorophenol	%	114			30-130	Pass	
2.6-Dichlorophenol	%	82			30-130	Pass	
4-Chloro-3-methylphenol	%	84			30-130	Pass	
Tetrachlorophenols - Total	%	114			30-130	Pass	
LCS - % Recovery							
Phenols (non-Halogenated)							
2-Cyclohexyl-4.6-dinitrophenol	%	126			30-130	Pass	
2-Methyl-4.6-dinitrophenol	%	119			30-130	Pass	
2-Methylphenol (o-Cresol)	%	61			30-130	Pass	
2-Nitrophenol	%	102			30-130	Pass	
2.4-Dimethylphenol	%	80			30-130	Pass	
2.4-Dinitrophenol	%	113			30-130	Pass	
3&4-Methylphenol (m&p-Cresol)	%	54			30-130	Pass	
4-Nitrophenol	%	84			30-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	85			70-130	Pass	
Arsenic (filtered)	%	88			70-130	Pass	
Cadmium	%	97			70-130	Pass	
Cadmium (filtered)	%	86			70-130	Pass	
Chromium	%	89			70-130	Pass	
Chromium (filtered)	%	78			70-130	Pass	
Copper	%	92			70-130	Pass	
Copper (filtered)	%	79			70-130	Pass	
Lead	%	102			70-130	Pass	
Lead (filtered)	%	81			70-130	Pass	
Mercury	%	121			70-130	Pass	
Mercury (filtered)	%	99			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Nickel			%	89			70-130	Pass	
Nickel (filtered)			%	77			70-130	Pass	
Zinc			%	94			70-130	Pass	
Zinc (filtered)			%	81			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic (filtered)	S17-My28874	NCP	%	90			70-130	Pass	
Cadmium (filtered)	S17-My28874	NCP	%	80			70-130	Pass	
Chromium (filtered)	S17-My28874	NCP	%	79			70-130	Pass	
Copper (filtered)	S17-My28874	NCP	%	71			70-130	Pass	
Lead (filtered)	S17-My28874	NCP	%	73			70-130	Pass	
Mercury (filtered)	S17-My28874	NCP	%	80			70-130	Pass	
Nickel (filtered)	S17-My28874	NCP	%	72			70-130	Pass	
Zinc (filtered)	S17-My28874	NCP	%	75			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S17-My29207	CP	%	104			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S17-My29207	CP	%	122			70-130	Pass	
Toluene	S17-My29207	CP	%	115			70-130	Pass	
Ethylbenzene	S17-My29207	CP	%	107			70-130	Pass	
m&p-Xylenes	S17-My29207	CP	%	120			70-130	Pass	
o-Xylene	S17-My29207	CP	%	116			70-130	Pass	
Xylenes - Total	S17-My29207	CP	%	118			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S17-My29207	CP	%	99			70-130	Pass	
TRH C6-C10	S17-My29207	CP	%	102			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	S17-My29208	CP	%	72			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S17-My29208	CP	%	101			70-130	Pass	
Toluene	S17-My29208	CP	%	105			70-130	Pass	
Ethylbenzene	S17-My29208	CP	%	99			70-130	Pass	
m&p-Xylenes	S17-My29208	CP	%	100			70-130	Pass	
o-Xylene	S17-My29208	CP	%	100			70-130	Pass	
Xylenes - Total	S17-My29208	CP	%	100			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethane	S17-My29208	CP	%	95			70-130	Pass	
1.1-Dichloroethene	S17-My29208	CP	%	98			70-130	Pass	
1.1.1-Trichloroethane	S17-My29208	CP	%	115			70-130	Pass	
1.1.1.2-Tetrachloroethane	S17-My29208	CP	%	106			70-130	Pass	
1.1.2-Trichloroethane	S17-My29208	CP	%	103			70-130	Pass	
1.1.2.2-Tetrachloroethane	S17-My29208	CP	%	96			70-130	Pass	
1.2-Dibromoethane	S17-My29208	CP	%	104			70-130	Pass	
1.2-Dichlorobenzene	S17-My29208	CP	%	100			70-130	Pass	
1.2-Dichloroethane	S17-My29208	CP	%	105			70-130	Pass	
1.2-Dichloropropane	S17-My29208	CP	%	96			70-130	Pass	
1.2.3-Trichloropropane	S17-My29208	CP	%	102			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.2.4-Trimethylbenzene	S17-My29208	CP	%	98			70-130	Pass	
1.3-Dichlorobenzene	S17-My29208	CP	%	102			70-130	Pass	
1.3-Dichloropropane	S17-My29208	CP	%	102			70-130	Pass	
1.3.5-Trimethylbenzene	S17-My29208	CP	%	97			70-130	Pass	
1.4-Dichlorobenzene	S17-My29208	CP	%	101			70-130	Pass	
2-Butanone (MEK)	S17-My29208	CP	%	101			70-130	Pass	
2-Propanone (Acetone)	S17-My29208	CP	%	111			70-130	Pass	
4-Chlorotoluene	S17-My29208	CP	%	100			70-130	Pass	
4-Methyl-2-pentanone (MIBK)	S17-My29208	CP	%	104			70-130	Pass	
Allyl chloride	S17-My29208	CP	%	84			70-130	Pass	
Bromobenzene	S17-My29208	CP	%	93			70-130	Pass	
Bromochloromethane	S17-My29208	CP	%	95			70-130	Pass	
Bromodichloromethane	S17-My29208	CP	%	105			70-130	Pass	
Bromoform	S17-My29208	CP	%	107			70-130	Pass	
Bromomethane	S17-My29208	CP	%	92			70-130	Pass	
Carbon disulfide	S17-My29208	CP	%	93			70-130	Pass	
Carbon Tetrachloride	S17-My29208	CP	%	116			70-130	Pass	
Chlorobenzene	S17-My29208	CP	%	102			70-130	Pass	
Chloroethane	S17-My29208	CP	%	100			70-130	Pass	
Chloroform	S17-My29208	CP	%	103			70-130	Pass	
Chloromethane	S17-My29208	CP	%	75			70-130	Pass	
cis-1.2-Dichloroethene	S17-My29208	CP	%	99			70-130	Pass	
cis-1.3-Dichloropropene	S17-My29208	CP	%	103			70-130	Pass	
Dibromochloromethane	S17-My29208	CP	%	110			70-130	Pass	
Dibromomethane	S17-My29208	CP	%	105			70-130	Pass	
Dichlorodifluoromethane	S17-My29208	CP	%	104			70-130	Pass	
Iodomethane	S17-My29208	CP	%	121			70-130	Pass	
Isopropyl benzene (Cumene)	S17-My29208	CP	%	100			70-130	Pass	
Methylene Chloride	S17-My29208	CP	%	93			70-130	Pass	
Styrene	S17-My29208	CP	%	98			70-130	Pass	
Tetrachloroethene	S17-My29208	CP	%	110			70-130	Pass	
trans-1.2-Dichloroethene	S17-My29208	CP	%	95			70-130	Pass	
trans-1.3-Dichloropropene	S17-My29208	CP	%	100			70-130	Pass	
Trichloroethene	S17-My29208	CP	%	107			70-130	Pass	
Trichlorofluoromethane	S17-My29208	CP	%	110			70-130	Pass	
Vinyl chloride	S17-My29208	CP	%	100			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S17-My29208	CP	%	103			70-130	Pass	
TRH >C10-C16	S17-My29208	CP	%	74			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M17-Ap06717	NCP	%	80			70-130	Pass	
Cadmium	M17-Ap06717	NCP	%	87			70-130	Pass	
Chromium	M17-Ap06717	NCP	%	74			70-130	Pass	
Copper	M17-Ap06717	NCP	%	77			70-130	Pass	
Lead	M17-Ap06717	NCP	%	92			70-130	Pass	
Mercury	M17-Ap06717	NCP	%	111			70-130	Pass	
Nickel	M17-Ap06717	NCP	%	75			70-130	Pass	
Zinc	M17-Ap06717	NCP	%	74			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S17-My29206	CP	mg/L	0.15	0.15	1.0	30%	Pass	

Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S17-My29206	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S17-My29206	CP	mg/L	0.073	0.071	2.0	30%	Pass	
Ethylbenzene	S17-My29206	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S17-My29206	CP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S17-My29206	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	S17-My29206	CP	mg/L	< 0.003	< 0.003	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S17-My29206	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
TRH C6-C10	S17-My29206	CP	mg/L	0.15	0.15	1.0	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic (filtered)	S17-My28960	NCP	mg/L	0.002	0.002	2.0	30%	Pass	
Cadmium (filtered)	S17-My28960	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	S17-My28960	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper (filtered)	S17-My28960	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead (filtered)	S17-My28960	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury (filtered)	S17-My28960	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel (filtered)	S17-My28960	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc (filtered)	S17-My28960	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1-Dichloroethene	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.1-Trichloroethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.2-Trichloroethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dibromoethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichlorobenzene	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichloroethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2-Dichloropropane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2.3-Trichloropropane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.2.4-Trimethylbenzene	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3-Dichlorobenzene	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3-Dichloropropane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.3.5-Trimethylbenzene	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
1.4-Dichlorobenzene	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
2-Butanone (MEK)	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
2-Propanone (Acetone)	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4-Chlorotoluene	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Allyl chloride	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromobenzene	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromochloromethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromodichloromethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromoform	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Bromomethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Carbon disulfide	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Carbon Tetrachloride	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chlorobenzene	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chloroethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chloroform	S17-My29209	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Chloromethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
cis-1.2-Dichloroethene	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
cis-1.3-Dichloropropene	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibromochloromethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibromomethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dichlorodifluoromethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Iodomethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Isopropyl benzene (Cumene)	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Methylene Chloride	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Styrene	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Tetrachloroethene	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
trans-1.2-Dichloroethene	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
trans-1.3-Dichloropropene	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Trichloroethene	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Trichlorofluoromethane	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Vinyl chloride	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S17-My26078	NCP	mg/L	0.002	< 0.001	<1	30%	Pass	
Cadmium	S17-My29209	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M17-My30918	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	S17-My29209	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	S17-My29209	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	S17-My30790	NCP	mg/L	0.003	0.003	7.0	30%	Pass	
Zinc	M17-My30918	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Nibha Vaidya	Analytical Services Manager
Ryan Hamilton	Senior Analyst-Metal (NSW)
Ryan Hamilton	Senior Analyst-Organic (NSW)
Ryan Hamilton	Senior Analyst-Volatile (NSW)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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549116

Enviro Sample NSW

From: Nibha Vaidya
Sent: Tuesday, 6 June 2017 11:56 AM
To: Enviro Sample NSW; COC NSW; Rupan Virk
Subject: 1 DAY TAT - FW: Eurofins | mgt Test Results - Report 548083 : Site PENRITH DSI (52372)

Additional TCLP please – 1 day TAT

Kind Regards,

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

From: Rohan Hammond [mailto:RHammond@jbsg.com.au]
Sent: Tuesday, 6 June 2017 11:25 AM
To: Nibha Vaidya
Subject: FW: Eurofins | mgt Test Results - Report 548083 : Site PENRITH DSI (52372)

Hi Nibha,

Apologies, can we change that to TCLP Lead on JHA02 0.3-0.5 and JHA02 0.1-0.2

No ASLPs required.

195 194

24 HR TAT (if possible).

Rohan.

From: Rohan Hammond
Sent: Tuesday, June 6, 2017 10:25 AM
To: 'NibhaVaidya@eurofins.com' <NibhaVaidya@eurofins.com>
Subject: RE: Eurofins | mgt Test Results - Report 548083 : Site PENRITH DSI (52372)

6/6 UL

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Site # 1254 & 14271

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Lane Cove West NSW 2066
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NATA # 1261 Site # 18217

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Murarrie QLD 4172
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NATA # 1261 Site # 20794

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Phone : +61 8 9251 9600
NATA # 1261 Site # 18217

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Rohan Hammond
Project name: ADDITIONAL - PENRITH DSI
Project ID: 52372
COC number: Not provided
Turn around time: 1 Day
Date/Time received: Jun 6, 2017 11:56 AM
Eurofins | mgt reference: **549116**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 10.8 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Rohan Hammond - rhammond@jbsg.com.au.

ABN– 50 005 085 521
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web : www.eurofins.com.au

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Site # 1254 & 14271

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Perth
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Kewdale WA 6105
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NATA # 1261
Site # 18217

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: ADDITIONAL - PENRITH DSI
Project ID: 52372

Order No.:
Report #: 549116
Phone: 02 8245 0300
Fax:

Received: Jun 6, 2017 11:56 AM
Due: Jun 8, 2017
Priority: 1 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Lead	USA Leaching Procedure
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 18217							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	JHA02_0.3-0.5	May 26, 2017		US Leachate	S17-Jn05473	X	X
2	JHA02_0.1-0.3	May 26, 2017		US Leachate	S17-Jn05474	X	X
Test Counts						2	2

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Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
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NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **549116-L**
Project name ADDITIONAL - PENRITH DSI
Project ID 52372
Received Date Jun 06, 2017

Client Sample ID			**JHA02_0.3-0.5**	**JHA02_0.1-0.3**
Sample Matrix			**US Leachate**	**US Leachate**
Eurofins | mgt Sample No.			**S17-Jn05473**	**S17-Jn05474**
Date Sampled			**May 26, 2017**	**May 26, 2017**
Test/Reference	LOR	Unit		
Heavy Metals				
Lead	0.01	mg/L	0.49	0.03
USA Leaching Procedure				
Leachate Fluid[C01]		comment	1.0	1.0
pH (initial)	0.1	pH Units	8.2	7.6
pH (off)	0.1	pH Units	5.1	5.1
pH (USA HCl addition)	0.1	pH Units	1.7	1.7

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Heavy Metals	Sydney	Jun 06, 2017	180 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
USA Leaching Procedure	Sydney	Jun 06, 2017	14 Day
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			

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Company Name:	JBS & G Australia (NSW) P/L	**Order No.:**		**Received:**	Jun 6, 2017 11:56 AM
Address:	Level 1, 50 Margaret St Sydney NSW 2000	**Report #:**	549116	**Due:**	Jun 8, 2017
		Phone:	02 8245 0300	**Priority:**	1 Day
		Fax:		**Contact Name:**	Rohan Hammond
Project Name:	ADDITIONAL - PENRITH DSI				
Project ID:	52372				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Lead	USA Leaching Procedure
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 18217							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	JHA02_0.3-0.5	May 26, 2017		US Leachate	S17-Jn05473	X	X
2	JHA02_0.1-0.3	May 26, 2017		US Leachate	S17-Jn05474	X	X
Test Counts						2	2

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Lead			mg/L	< 0.01			0.01	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Heavy Metals				Result 1					
Lead	S17-Jn05434	NCP	%	76			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	S17-Jn05474	CP	mg/L	0.03	0.03	3.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other

Authorised By

Nibha Vaidya	Analytical Services Manager
Ryan Hamilton	Senior Analyst-Metal (NSW)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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010783

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52372
PROJECT NAME: Dennys
DATE NEEDED BY: Std

LABORATORY BATCH NO.:
SAMPLERS: AH
QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) RHamman@jbsg.com.au; (3) .....@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

545643

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	VOCs 8260	Lagoon Analysis TRH		TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
01	Carbon	5/5/17	-	Carbon tube	NA	X	X	X			
02								X			
03											
04								X			
05											
06											
07											
08											
09											
10											
QC01-SW								X			
MB											

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Richard DATE: 10/5/17	CONSIGNMENT NOTE NO.	NAME: Vinod Jaus 17:00	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 10/5/17	
		OF: EFFORT	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody - Generic

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Version: 1, Version Date: 14/04/2021

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Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Rohan Hammond
Project name: PENRITH
Project ID: 52372
COC number: Not provided
Turn around time: 5 Day
Date/Time received: May 10, 2017 5:00 PM
Eurofins | mgt reference: **545643**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 28 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☒ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Rohan Hammond - rhammond@jbsg.com.au.

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 545643
Phone: 02 8245 0300
Fax:

Received: May 10, 2017 5:00 PM
Due: May 17, 2017
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Isopropanol*	VOC AIR-TRH (Total Recoverable Hydrocarbons)	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 18217								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	SV01_FRONT	May 05, 2017		Air	S17-My10366	X	X	X
2	SV01_BACK	May 05, 2017		Air	S17-My10367	X	X	X
3	SV02_FRONT	May 05, 2017		Air	S17-My10368	X	X	X
4	SV02_BACK	May 05, 2017		Air	S17-My10369	X	X	X
5	SV03_FRONT	May 05, 2017		Air	S17-My10370	X		X
6	SV03_BACK	May 05, 2017		Air	S17-My10371	X		X
7	SV04_FRONT	May 05, 2017		Air	S17-My10372	X	X	X
8	SV04_BACK	May 05, 2017		Air	S17-My10373	X	X	X
9	SV05_FRONT	May 05, 2017		Air	S17-My10374	X		X

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Company Name:	JBS & G Australia (NSW) P/L	**Order No.:**	
Address:	Level 1, 50 Margaret St Sydney NSW 2000	**Report #:**	545643
		Phone:	02 8245 0300
		Fax:	
Project Name:	PENRITH		
Project ID:	52372		

Received:	May 10, 2017 5:00 PM	
Due:	May 17, 2017	
Priority:	5 Day	
Contact Name:	Rohan Hammond	

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Isopropanol*	VOC AIR-TRH (Total Recoverable Hydrocarbons)	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 18217								
10	SV05_BACK	May 05, 2017		Air	S17-My10375	X		X
11	SV06_FRONT	May 05, 2017		Air	S17-My10376	X		X
12	SV06_BACK	May 05, 2017		Air	S17-My10377	X		X
13	SV07_FRONT	May 05, 2017		Air	S17-My10378	X		X
14	SV07_BACK	May 05, 2017		Air	S17-My10379	X		X
15	SV08_FRONT	May 05, 2017		Air	S17-My10380	X		X
16	SV08_BACK	May 05, 2017		Air	S17-My10381	X		X
17	SV09_FRONT	May 05, 2017		Air	S17-My10382	X		X
18	SV09_BACK	May 05, 2017		Air	S17-My10383	X		X
19	SV10_FRONT	May 05, 2017		Air	S17-My10384	X		X
20	SV10_BACK	May 05, 2017		Air	S17-My10385	X		X
21	QC01_SV_FR	May 05, 2017		Air	S17-My10386	X	X	X

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Project Name: PENRITH
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Order No.:
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Phone: 02 8245 0300
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Received: May 10, 2017 5:00 PM
Due: May 17, 2017
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Isopropanol*	VOC AIR-TRH (Total Recoverable Hydrocarbons)	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 18217								
	ONT							
22	QC01_SV_BACK	May 05, 2017		Air	S17-My10387	X	X	X
23	MB_FRONT	May 05, 2017		Air	S17-My10388	X		X
24	MB_BACK	May 05, 2017		Air	S17-My10389	X		X
Test Counts						24	8	24

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Certificate of Analysis

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Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **545643-A**
Project name PENRITH
Project ID 52372
Received Date May 10, 2017

Client Sample ID			**SV01_FRONT**	**SV01_BACK**	**SV02_FRONT**	**SV02_BACK**
Sample Matrix			**Air**	**Air**	**Air**	**Air**
Eurofins | mgt Sample No.			**S17-My10366**	**S17-My10367**	**S17-My10368**	**S17-My10369**
Date Sampled			**May 05, 2017**	**May 05, 2017**	**May 05, 2017**	**May 05, 2017**
Test/Reference	LOR	Unit				
Isopropanol*	10	Total ug	< 10	< 10	< 10	< 10
TRH >C10-C16	10	Total ug	< 10	< 10	< 10	< 10
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH C6-C10	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Client Sample ID			SV01_FRONT	SV01_BACK	SV02_FRONT	SV02_BACK
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			S17-My10366	S17-My10367	S17-My10368	S17-My10369
Date Sampled			May 05, 2017	May 05, 2017	May 05, 2017	May 05, 2017
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total	1.5	Total ug	< 1.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	113	111	123	119
4-Bromofluorobenzene (surr.)	1	%	94	93	95	96
Dibromofluoromethane (surr.)	1	%	102	99	110	104
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV03_FRONT	SV03_BACK	SV04_FRONT	SV04_BACK
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			S17-My10370	S17-My10371	S17-My10372	S17-My10373
Date Sampled			May 05, 2017	May 05, 2017	May 05, 2017	May 05, 2017
Test/Reference	LOR	Unit				
Isopropanol*	10	Total ug	< 10	< 10	< 10	< 10
TRH >C10-C16	10	Total ug	-	-	< 10	< 10
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH C6-C10	10	Total ug	-	-	11	< 10
VOCs in Ambient Air by GC/MS						
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV03_FRONT	SV03_BACK	SV04_FRONT	SV04_BACK
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			S17-My10370	S17-My10371	S17-My10372	S17-My10373
Date Sampled			May 05, 2017	May 05, 2017	May 05, 2017	May 05, 2017
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	< 0.5	< 0.5	10	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total	1.5	Total ug	< 1.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	121	119	117	119
4-Bromofluorobenzene (surr.)	1	%	102	97	94	98
Dibromofluoromethane (surr.)	1	%	110	105	106	107
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV05_FRONT	SV05_BACK	SV06_FRONT	SV06_BACK
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			S17-My10374	S17-My10375	S17-My10376	S17-My10377
Date Sampled			May 05, 2017	May 05, 2017	May 05, 2017	May 05, 2017
Test/Reference	LOR	Unit				
Isopropanol*	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	340	< 0.5	< 0.5	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	56	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total	1.5	Total ug	< 1.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	132	121	116	119
4-Bromofluorobenzene (surr.)	1	%	106	97	98	94

Client Sample ID			SV05_FRONT	SV05_BACK	SV06_FRONT	SV06_BACK
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			S17-My10374	S17-My10375	S17-My10376	S17-My10377
Date Sampled			May 05, 2017	May 05, 2017	May 05, 2017	May 05, 2017
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
Dibromofluoromethane (surr.)	1	%	116	107	102	106
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV07_FRONT	SV07_BACK	SV08_FRONT	SV08_BACK
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			S17-My10378	S17-My10379	S17-My10380	S17-My10381
Date Sampled			May 05, 2017	May 05, 2017	May 05, 2017	May 05, 2017
Test/Reference	LOR	Unit				
Isopropanol*	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV07_FRONT	SV07_BACK	SV08_FRONT	SV08_BACK
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			S17-My10378	S17-My10379	S17-My10380	S17-My10381
Date Sampled			May 05, 2017	May 05, 2017	May 05, 2017	May 05, 2017
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total	1.5	Total ug	< 1.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	118	116	117	125
4-Bromofluorobenzene (surr.)	1	%	98	96	95	98
Dibromofluoromethane (surr.)	1	%	110	103	106	109
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV09_FRONT	SV09_BACK	SV10_FRONT	SV10_BACK
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			S17-My10382	S17-My10383	S17-My10384	S17-My10385
Date Sampled			May 05, 2017	May 05, 2017	May 05, 2017	May 05, 2017
Test/Reference	LOR	Unit				
Isopropanol*	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV09_FRONT	SV09_BACK	SV10_FRONT	SV10_BACK
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			S17-My10382	S17-My10383	S17-My10384	S17-My10385
Date Sampled			May 05, 2017	May 05, 2017	May 05, 2017	May 05, 2017
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	< 0.5	< 0.5	87	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5	21	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total	1.5	Total ug	< 1.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	120	116	120	122
4-Bromofluorobenzene (surr.)	1	%	97	90	93	99
Dibromofluoromethane (surr.)	1	%	107	100	107	105
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			QC01_SV_FRONT	QC01_SV_BACK	MB_FRONT	MB_BACK
Sample Matrix			**Air**	**Air**	**Air**	**Air**
Eurofins | mgt Sample No.			**S17-My10386**	**S17-My10387**	**S17-My10388**	**S17-My10389**
Date Sampled			**May 05, 2017**	**May 05, 2017**	**May 05, 2017**	**May 05, 2017**
Test/Reference	LOR	Unit				
Isopropanol*	10	Total ug	< 10	< 10	< 10	< 10
TRH >C10-C16	10	Total ug	< 10	< 10	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
TRH C6-C10	10	Total ug	< 10	< 10	-	-
VOCs in Ambient Air by GC/MS						
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			QC01_SV_FRONT	QC01_SV_BACK	MB_FRONT	MB_BACK
Sample Matrix			**Air**	**Air**	**Air**	**Air**
Eurofins | mgt Sample No.			**S17-My10386**	**S17-My10387**	**S17-My10388**	**S17-My10389**
Date Sampled			**May 05, 2017**	**May 05, 2017**	**May 05, 2017**	**May 05, 2017**
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
Xylenes - Total	1.5	Total ug	< 1.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	120	123	119	121
4-Bromofluorobenzene (surr.)	1	%	92	92	95	95
Dibromofluoromethane (surr.)	1	%	105	107	105	105
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Isopropanol*	Melbourne	May 10, 2017	14 Day
- Method: Isopropanol : NIOSH 1400			
VOCs in Ambient Air by GC/MS	Melbourne	May 10, 2017	14 Day
- Method: LTM-ORG-2030 VOCs in Ambient Air by GC/MS			
VOC AIR-TRH (Total Recoverable Hydrocarbons)			
TRH >C10-C16	Melbourne	May 10, 2017	7 Day
- Method: MGT 100A			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	May 10, 2017	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			

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NATA # 1261
Site # 18217

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 545643
Phone: 02 8245 0300
Fax:

Received: May 10, 2017 5:00 PM
Due: May 17, 2017
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Isopropanol*	VOC AIR-TRH (Total Recoverable Hydrocarbons)	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 18217								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	SV01_FRONT	May 05, 2017		Air	S17-My10366	X	X	X
2	SV01_BACK	May 05, 2017		Air	S17-My10367	X	X	X
3	SV02_FRONT	May 05, 2017		Air	S17-My10368	X	X	X
4	SV02_BACK	May 05, 2017		Air	S17-My10369	X	X	X
5	SV03_FRONT	May 05, 2017		Air	S17-My10370	X		X
6	SV03_BACK	May 05, 2017		Air	S17-My10371	X		X
7	SV04_FRONT	May 05, 2017		Air	S17-My10372	X	X	X
8	SV04_BACK	May 05, 2017		Air	S17-My10373	X	X	X
9	SV05_FRONT	May 05, 2017		Air	S17-My10374	X		X

Document Set ID: 9547379
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NATA # 1261
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Company Name: JBS & G Australia (NSW) P/L
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Project Name: PENRITH
Project ID: 52372

Order No.:
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Phone: 02 8245 0300
Fax:

Received: May 10, 2017 5:00 PM
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Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Isopropanol*	VOC AIR-TRH (Total Recoverable Hydrocarbons)	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 18217								
10	SV05_BACK	May 05, 2017		Air	S17-My10375	X		X
11	SV06_FRONT	May 05, 2017		Air	S17-My10376	X		X
12	SV06_BACK	May 05, 2017		Air	S17-My10377	X		X
13	SV07_FRONT	May 05, 2017		Air	S17-My10378	X		X
14	SV07_BACK	May 05, 2017		Air	S17-My10379	X		X
15	SV08_FRONT	May 05, 2017		Air	S17-My10380	X		X
16	SV08_BACK	May 05, 2017		Air	S17-My10381	X		X
17	SV09_FRONT	May 05, 2017		Air	S17-My10382	X		X
18	SV09_BACK	May 05, 2017		Air	S17-My10383	X		X
19	SV10_FRONT	May 05, 2017		Air	S17-My10384	X		X
20	SV10_BACK	May 05, 2017		Air	S17-My10385	X		X
21	QC01_SV_FR	May 05, 2017		Air	S17-My10386	X	X	X

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Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Isopropanol*	VOC AIR-TRH (Total Recoverable Hydrocarbons)	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X
Sydney Laboratory - NATA Site # 18217								
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 18217								
	ONT							
22	QC01_SV_BACK	May 05, 2017		Air	S17-My10387	X	X	X
23	MB_FRONT	May 05, 2017		Air	S17-My10388	X		X
24	MB_BACK	May 05, 2017		Air	S17-My10389	X		X
Test Counts						24	8	24

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

ug/L: micrograms per litre

ppb: Parts per billion

org/100mL: Organisms per 100 millilitres

MPN/100mL: Most Probable Number of organisms per 100 millilitres

mg/L: milligrams per litre

ppm: Parts per million

%: Percentage

NTU: Nephelometric Turbidity Units

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs 20-130%

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
VOCs in Ambient Air by GC/MS							
Naphthalene	Total ug	< 0.5			0.5	Pass	
1.1-Dichloroethane	Total ug	< 0.5			0.5	Pass	
1.1-Dichloroethene	Total ug	< 0.5			0.5	Pass	
1.1-Dichloropropene	Total ug	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	Total ug	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	Total ug	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	Total ug	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	Total ug	< 0.5			0.5	Pass	
1.2-Dibromo-3-chloropropane	Total ug	< 0.5			0.5	Pass	
1.2-Dibromoethane	Total ug	< 0.5			0.5	Pass	
1.2-Dichloroethane	Total ug	< 0.5			0.5	Pass	
1.2-Dichloropropane	Total ug	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	Total ug	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	Total ug	< 0.5			0.5	Pass	
1.3-Dichloropropane	Total ug	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	Total ug	< 0.5			0.5	Pass	
2-Chlorotoluene	Total ug	< 0.5			0.5	Pass	
2.2-Dichloropropane	Total ug	< 0.5			0.5	Pass	
4-Chlorotoluene	Total ug	< 0.5			0.5	Pass	
Benzene	Total ug	< 0.5			0.5	Pass	
Bromochloromethane	Total ug	< 0.5			0.5	Pass	
Bromodichloromethane	Total ug	< 0.5			0.5	Pass	
Bromoform	Total ug	< 0.5			0.5	Pass	
Carbon Tetrachloride	Total ug	< 0.5			0.5	Pass	
Chlorobenzene	Total ug	< 0.5			0.5	Pass	
Chloroform	Total ug	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	Total ug	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	Total ug	< 0.5			0.5	Pass	
Dibromochloromethane	Total ug	< 0.5			0.5	Pass	
Dibromomethane	Total ug	< 0.5			0.5	Pass	
Ethylbenzene	Total ug	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	Total ug	< 0.5			0.5	Pass	
n-Butylbenzene	Total ug	< 0.5			0.5	Pass	
n-Propylbenzene	Total ug	< 0.5			0.5	Pass	
p-Isopropyltoluene	Total ug	< 0.5			0.5	Pass	
sec-Butylbenzene	Total ug	< 0.5			0.5	Pass	
Styrene	Total ug	< 5			5	Pass	
tert-Butylbenzene	Total ug	< 0.5			0.5	Pass	
Tetrachloroethene	Total ug	< 0.5			0.5	Pass	
Toluene	Total ug	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	Total ug	< 0.5			0.5	Pass	
Trichloroethene	Total ug	< 0.5			0.5	Pass	
Trichlorofluoromethane	Total ug	< 0.5			0.5	Pass	
Vinyl chloride	Total ug	< 0.5			0.5	Pass	
Xylenes - Total	Total ug	< 1.5			1.5	Pass	
1.2-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.2.3-Trichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.2.4-Trichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Hexachlorobutadiene	Total ug	< 0.5			0.5	Pass	
LCS - % Recovery							
VOCs in Ambient Air by GC/MS							
Naphthalene	%	100			70-130	Pass	
Benzene	%	115			70-130	Pass	
Ethylbenzene	%	89			70-130	Pass	
Toluene	%	92			70-130	Pass	
Trichloroethene	%	104			70-130	Pass	
Xylenes - Total	%	94			70-130	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	N/A
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Alex Petridis	Senior Analyst-Organic (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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CERTIFICATE OF ANALYSIS □□□□2□

Client:
JBS □ □ □NSW □ WA□Pty Ltd
Level 1, 50 Margaret St
Sydney
NSW 2000

Attention: Rohan Hammond

Sample log in details:

Your Reference:	**□2□□2□Penrith**
No. of samples:	4 soils
Date samples received / completed instructions received	08/05/17 / 11/05/17

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	18/05/17 / 18/05/17
Date of Preliminary Report:	Not Issued

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Accredited for compliance with ISO/IEC 17025 - Testing **Tests not covered by NATA are denoted with □□**

Results Approved By:

David Springer
General Manager

ACCREDITED FOR TECHNICAL COMPETENCE

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

VOCs in soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- - ----------	 166525-1 □A20170506-1 6/05/2017 Soil
Date extracted	-	12/05/2017
Date analysed	-	12/05/2017
Dichlorodifluoromethane	mg/kg	□1
Chloromethane	mg/kg	□1
Vinyl Chloride	mg/kg	□1
Bromomethane	mg/kg	□1
Chloroethane	mg/kg	□1
Trichlorofluoromethane	mg/kg	□1
1,1-Dichloroethene	mg/kg	□1
trans-1,2-dichloroethene	mg/kg	□1
1,1-dichloroethane	mg/kg	□1
cis-1,2-dichloroethene	mg/kg	□1
bromochloromethane	mg/kg	□1
chloroform	mg/kg	□1
2,2-dichloropropane	mg/kg	□1
1,2-dichloroethane	mg/kg	□1
1,1,1-trichloroethane	mg/kg	□1
1,1-dichloropropene	mg/kg	□1
Cyclohexane	mg/kg	□1
carbon tetrachloride	mg/kg	□1
Benzene	mg/kg	□0.2
dibromomethane	mg/kg	□1
1,2-dichloropropane	mg/kg	□1
trichloroethene	mg/kg	□1
bromodichloromethane	mg/kg	□1
trans-1,3-dichloropropene	mg/kg	□1
cis-1,3-dichloropropene	mg/kg	□1
1,1,2-trichloroethane	mg/kg	□1
Toluene	mg/kg	□0.5
1,3-dichloropropane	mg/kg	□1
dibromochloromethane	mg/kg	□1
1,2-dibromoethane	mg/kg	□1
tetrachloroethene	mg/kg	□1
1,1,1,2-tetrachloroethane	mg/kg	□1
chlorobenzene	mg/kg	□1
Ethylbenzene	mg/kg	□1
bromoform	mg/kg	□1
m□p-xylene	mg/kg	□2
styrene	mg/kg	□1
1,1,2,2-tetrachloroethane	mg/kg	□1
o-□ylene	mg/kg	□1

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

VOCs in soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- - ---------- 	166525-1 □A20170506-1 6/05/2017 Soil
1,2,3-trichloropropane	mg/kg	□1
isopropylbenzene	mg/kg	□1
bromobenzene	mg/kg	□1
n-propyl benzene	mg/kg	□1
2-chlorotoluene	mg/kg	□1
4-chlorotoluene	mg/kg	□1
1,3,5-trimethyl benzene	mg/kg	□1
tert-butyl benzene	mg/kg	□1
1,2,4-trimethyl benzene	mg/kg	□1
1,3-dichlorobenzene	mg/kg	□1
sec-butyl benzene	mg/kg	□1
1,4-dichlorobenzene	mg/kg	□1
4-isopropyl toluene	mg/kg	□1
1,2-dichlorobenzene	mg/kg	□1
n-butyl benzene	mg/kg	□1
1,2-dibromo-3-chloropropane	mg/kg	□1
1,2,4-trichlorobenzene	mg/kg	□1
hexachlorobutadiene	mg/kg	□1
1,2,3-trichlorobenzene	mg/kg	□1
Surrogate Dibromofluorometha	□	112
Surrogate aaa-Trifluorotoluene	□	99
Surrogate Toluene-d8	□	98
Surrogate 4-Bromofluorobenzene	□	91

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

vTRH(C6-C10)/BTE□N in Soil		
Our Reference:	UNITS	166525-1
Your Reference	---------- -	□A20170506-1
Date Sampled	----------	6/05/2017
Type of sample		Soil
Date extracted	-	12/05/2017
Date analysed	-	12/05/2017
TRHC6 - C9	mg/kg	□25
TRHC6 - C10	mg/kg	□25
vTPHC6 - C10 less BTE□ (F1)	mg/kg	□25
Benzene	mg/kg	□0.2
Toluene	mg/kg	□0.5
Ethylbenzene	mg/kg	□1
m□p-xylene	mg/kg	□2
o-□ylene	mg/kg	□1
Total □ve □ylenes	mg/kg	□1
naphthalene	mg/kg	□1
Surrogate aaa-Trifluorotoluene	□	99

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

svTRH (C10-C40) in Soil		
Our Reference:	UNITS	166525-1
Your Reference	---------- -	□A20170506-1
Date Sampled	----------	6/05/2017
Type of sample		Soil
Date extracted	-	12/05/2017
Date analysed	-	13/05/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	□50
TRHC$_{15}$ - C$_{28}$	mg/kg	□100
TRHC$_{29}$ - C$_{36}$	mg/kg	□100
TRH □C$_{10}$-C$_{16}$	mg/kg	□50
TRH □C$_{10}$ - C$_{16}$ less Naphthalene (F2)	mg/kg	□50
TRH □C$_{16}$-C$_{34}$	mg/kg	□100
TRH □C$_{34}$-C$_{40}$	mg/kg	□100
Total □ve TRH (□C10-C40)	mg/kg	□50
Surrogate o-Terphenyl	□	98

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

PAHs in Soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- - ---------- 	166525-1 □A20170506-1 6/05/2017 Soil
Date extracted	-	12/05/2017
Date analysed	-	15/05/2017
Naphthalene	mg/kg	□0.1
Acenaphthylene	mg/kg	□0.1
Acenaphthene	mg/kg	□0.1
Fluorene	mg/kg	□0.1
Phenanthrene	mg/kg	□0.1
Anthracene	mg/kg	□0.1
Fluoranthene	mg/kg	□0.1
Pyrene	mg/kg	□0.1
Benzo(a)anthracene	mg/kg	□0.1
Chrysene	mg/kg	□0.1
Benzo(b,j□k)fluoranthene	mg/kg	□0.2
Benzo(a)pyrene	mg/kg	□0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	□0.1
Dibenzo(a,h)anthracene	mg/kg	□0.1
Benzo(g,h,i)perylene	mg/kg	□0.1
Benzo(a)pyrene TE□ calc (zero)	mg/kg	□0.5
Benzo(a)pyrene TE□ calc(half)	mg/kg	□0.5
Benzo(a)pyrene TE□ calc(P□L)	mg/kg	□0.5
Total □ve PAH's	mg/kg	□0.05
Surrogate p-Terphenyl-d14	□	85

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Organochlorine Pesticides in soil		
Our Reference:	UNITS	166525-1
Your Reference	---------- -	□A20170506-1
Date Sampled	----------	6/05/2017
Type of sample		Soil
Date extracted	-	12/05/2017
Date analysed	-	12/05/2017
HCB	mg/kg	□0.1
alpha-BHC	mg/kg	□0.1
gamma-BHC	mg/kg	□0.1
beta-BHC	mg/kg	□0.1
Heptachlor	mg/kg	□0.1
delta-BHC	mg/kg	□0.1
Aldrin	mg/kg	□0.1
Heptachlor Epoxide	mg/kg	□0.1
gamma-Chlordane	mg/kg	□0.1
alpha-chlordane	mg/kg	□0.1
Endosulfan I	mg/kg	□0.1
pp-DDE	mg/kg	□0.1
Dieldrin	mg/kg	□0.1
Endrin	mg/kg	□0.1
pp-DDD	mg/kg	□0.1
Endosulfan II	mg/kg	□0.1
pp-DDT	mg/kg	□0.1
Endrin Aldehyde	mg/kg	□0.1
Endosulfan Sulphate	mg/kg	□0.1
Methoxychlor	mg/kg	□0.1
Total □ve DDT□DDD□DDE	mg/kg	□0.1
Surrogate TCM□	□	86

PCBs in Soil		
Our Reference:	UNITS	166525-1
Your Reference	---------- -	□A20170506-1
Date Sampled	----------	6/05/2017
Type of sample		Soil
Date extracted	-	12/05/2017
Date analysed	-	12/05/2017
Aroclor 1016	mg/kg	□0.1
Aroclor 1221	mg/kg	□0.1
Aroclor 1232	mg/kg	□0.1
Aroclor 1242	mg/kg	□0.1
Aroclor 1248	mg/kg	□0.1
Aroclor 1254	mg/kg	□0.1
Aroclor 1260	mg/kg	□0.1
Total □ve PCBs (1016-1260)	mg/kg	□0.1
Surrogate TCLM□	□	86

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Acid Extractable metals in soil Our Reference: Your Reference Date Sampled Type of sample	UNITS ---------- - ---------- 	166525-1 □A20170506-1 6/05/2017 Soil	166525-2 □A20170506-2 6/05/2017 Soil
Date prepared	-	12/05/2017	12/05/2017
Date analysed	-	12/05/2017	12/05/2017
Arsenic	mg/kg	4	6
Cadmium	mg/kg	□0.4	□0.4
Chromium	mg/kg	38	32
Copper	mg/kg	5	15
Lead	mg/kg	8	14
Mercury	mg/kg	□0.1	□0.1
Nickel	mg/kg	2	4
□inc	mg/kg	3	11

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Misc Soil - Inorg		
Our Reference:	UNITS	166525-1
Your Reference	---------- -	□A20170506-1
Date Sampled	----------	6/05/2017
Type of sample		Soil
Date prepared	-	12/05/2017
Date analysed	-	12/05/2017
Total Phenolics (as Phenol)	mg/kg	□5

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Moisture Our Reference: Your Reference	UNITS ----------	166525-1 □A20170506-1	166525-2 □A20170506-2
Date Sampled	----------	6/05/2017	6/05/2017
Type of sample		Soil	Soil
Date prepared	-	12/05/2017	12/05/2017
Date analysed	-	15/05/2017	15/05/2017
Moisture	□	7.5	8.5

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Asbestos ID - soils NEPM - ASB-001		
Our Reference:	UNITS	166525-1
Your Reference	---------- -	□A20170506-1
Date Sampled	----------	6/05/2017
Type of sample		Soil
Date analysed	-	16/05/2017
Sample mass tested	g	528.12
Sample Description	-	Brown coarse-grained soil □ rocks
Asbestos ID in soil (AS4964) □0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected
Total Asbestos□[1]	g/kg	□0.1
Asbestos ID in soil □0.1g/kg□	-	No visible asbestos detected
ACM □7mm Estimation□	g	□
FA and AF Estimation□	g	□
ACM □7mm Estimation□	□ (w/w)	□0.01
FA and AF Estimation□[2]	□ (w/w)	□0.001

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Method ID	Methodology Summary
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 □(C6-C10)-BTE□ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 □(C6-C10)-BTE□ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total □ve □ylene P□L is reflective of the lowest individual P□L and is therefore "Total □ve □ylenes" is simply a sum of the positive individual □ylenes.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 □(□C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 □(□C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total □ve TRH P□L is reflective of the lowest individual P□L and is therefore "Total □ve TRH" is simply a sum of the positive individual TRH fractions (□C10-C40).
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TE□ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. □TE□ P□L□values are assuming all contributing PAHs reported as □P□L are actually at the P□L. This is the most conservative approach and can give false positive TE□s given that PAHs that contribute to the TE□ calculation may not be present. 2. □TE□ zero□values are assuming all contributing PAHs reported as □P□L are zero. This is the least conservative approach and is more susceptible to false negative TE□s when PAHs that contribute to the TE□ calculation are present but below P□L. 3. □TE□ half P□L□values are assuming all contributing PAHs reported as □P□L are half the stipulated P□L. Hence a mid-point between the most and least conservative approaches above. Note, the Total □ve PAHs P□L is reflective of the lowest individual P□L and is therefore "Total □ve PAHs" is simply a sum of the positive individual PAHs.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. Note, the Total □ve reported DDD□DDE□DDT P□L is reflective of the lowest individual P□L and is therefore simply a sum of the positive individually report DDD□DDE□DDT.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total □ve PCBs P□L is reflective of the lowest individual P□L and is therefore" Total □ve PCBs" is simply a sum of the positive individual PCBs.
Metals-020	Determination of various metals by ICP-AES.

Method ID	Methodology Summary
Metals-021	Determination of Mercury by Cold Vapour AAS.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Inorg-008	Moisture content determined by heating at 105□/-5 □C for a minimum of 12 hours.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01□ w/w) as per Australian Standard AS4964-2004. Results reported denoted with □are outside our scope of NATA accreditation. **NOTE** □1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM □7mm, □7mm and FA/AF) **NOTE** □2 The screening level of 0.001□ w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation □Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
ASB-001	Asbestos ID - □ualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

□UALITY CONTROL VOCs in soil	UNITS	P□L	METHOD	Blank	Duplicate Sm□	Duplicate results Base ll Duplicate ll □ RPD	Spike Sm□	Spike □ Recovery
Date extracted	-			12/05/2017	166525-1	12/05/2017 □12/05/2017	LCS-5	12/05/2017
Date analysed	-			12/05/2017	166525-1	12/05/2017 □12/05/2017	LCS-5	12/05/2017
Dichlorodifluoromethane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
Chloromethane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
Vinyl Chloride	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
Bromomethane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
Chloroethane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
Trichlorofluoromethane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
1,1-Dichloroethene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
trans-1,2-dichloroethene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
1,1-dichloroethane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	LCS-5	97□
cis-1,2-dichloroethene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
bromochloromethane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
chloroform	mg/kg	1	Org-014	□1	166525-1	□1 □□1	LCS-5	104□
2,2-dichloropropane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
1,2-dichloroethane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	LCS-5	111□
1,1,1-trichloroethane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	LCS-5	101□
1,1-dichloropropene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
Cyclohexane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
carbon tetrachloride	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
Benzene	mg/kg	0.2	Org-014	□0.2	166525-1	□0.2 □□0.2	lNR□	lNR□
dibromomethane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
1,2-dichloropropane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
trichloroethene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	LCS-5	94□
bromodichloromethane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	LCS-5	116□
trans-1,3-dichloropropene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
cis-1,3-dichloropropene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
1,1,2-trichloroethane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
Toluene	mg/kg	0.5	Org-014	□0.5	166525-1	□0.5 □□0.5	lNR□	lNR□
1,3-dichloropropane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
dibromochloromethane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	LCS-5	128□
1,2-dibromoethane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
tetrachloroethene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	LCS-5	108□
1,1,1,2-tetrachloroethane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
chlorobenzene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
Ethylbenzene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
bromoform	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
m□p-xylene	mg/kg	2	Org-014	□2	166525-1	□2 □□2	lNR□	lNR□
styrene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
1,1,2,2-tetrachloroethane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
o-□ylene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□
1,2,3-trichloropropane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	lNR□	lNR□

□UALITY CONTROL VOCs in soil	UNITS	P□L	METHOD	Blank	Duplicate Sm□	Duplicate results Base II Duplicate II □ RPD	Spike Sm□	Spike □ Recovery
isopropylbenzene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
bromobenzene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
n-propyl benzene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
2-chlorotoluene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
4-chlorotoluene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
1,3,5-trimethyl benzene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
tert-butyl benzene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
1,2,4-trimethyl benzene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
1,3-dichlorobenzene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
sec-butyl benzene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
1,4-dichlorobenzene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
4-isopropyl toluene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
1,2-dichlorobenzene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
n-butyl benzene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
1,2-dibromo-3-chloropropane	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
1,2,4-trichlorobenzene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
hexachlorobutadiene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
1,2,3-trichlorobenzene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
Surrogate Dibromofluorometha	□		Org-014	110	166525-1	112 □□114 □□RPD: 2	LCS-5	109□
Surrogate aaa-Trifluorotoluene	□		Org-014	100	166525-1	99 □□98 □□RPD: 1	LCS-5	97□
Surrogate Toluene-d8	□		Org-014	97	166525-1	98 □□97 □□RPD: 1	LCS-5	98□
Surrogate 4-Bromofluorobenzene	□		Org-014	92	166525-1	91 □□95 □□RPD: 4	LCS-5	103□

□UALITY CONTROL vTRH(C6-C10)/BTE□N in Soil	UNITS	P□L	METHOD	Blank	Duplicate Sm□	Duplicate results Base II Duplicate II □ RPD	Spike Sm□	Spike □ Recovery
Date extracted	-			12/05/2017	166525-1	12/05/2017 □□12/05/2017	LCS-5	12/05/2017
Date analysed	-			12/05/2017	166525-1	12/05/2017 □□12/05/2017	LCS-5	12/05/2017
TRHC6 - C9	mg/kg	25	Org-016	□25	166525-1	□25 □□25	LCS-5	103□
TRHC6 - C10	mg/kg	25	Org-016	□25	166525-1	□25 □□25	LCS-5	103□
Benzene	mg/kg	0.2	Org-016	□0.2	166525-1	□0.2 □□0.2	LCS-5	92□
Toluene	mg/kg	0.5	Org-016	□0.5	166525-1	□0.5 □□0.5	LCS-5	96□
Ethylbenzene	mg/kg	1	Org-016	□1	166525-1	□1 □□1	LCS-5	102□
m□p-xylene	mg/kg	2	Org-016	□2	166525-1	□2 □□2	LCS-5	112□
o-□ylene	mg/kg	1	Org-016	□1	166525-1	□1 □□1	LCS-5	98□
naphthalene	mg/kg	1	Org-014	□1	166525-1	□1 □□1	□NR□	□NR□
Surrogate aaa-Trifluorotoluene	□		Org-016	100	166525-1	99 □98 □RPD: 1	LCS-5	97□

□UALITY CONTROL svTRH (C10-C40) in Soil	UNITS	P□L	METHOD	Blank	Duplicate Sm□	Duplicate results Base II Duplicate II □ RPD	Spike Sm□	Spike □ Recovery
Date extracted	-			12/05/2017	166525-1	12/05/2017 □□12/05/2017	LCS-5	12/05/2017
Date analysed	-			12/05/2017	166525-1	13/05/2017 □□13/05/2017	LCS-5	12/05/2017
TRHC10 - C14	mg/kg	50	Org-003	□50	166525-1	□50 □□50	LCS-5	106□
TRHC15 - C28	mg/kg	100	Org-003	□100	166525-1	□100 □□100	LCS-5	100□
TRHC29 - C36	mg/kg	100	Org-003	□100	166525-1	□100 □□100	LCS-5	91□
TRH □C10-C16	mg/kg	50	Org-003	□50	166525-1	□50 □□50	LCS-5	106□
TRH □C16-C34	mg/kg	100	Org-003	□100	166525-1	□100 □□100	LCS-5	100□
TRH □C34-C40	mg/kg	100	Org-003	□100	166525-1	□100 □□100	LCS-5	91□
Surrogate o-Terphenyl	□		Org-003	100	166525-1	98 □97 □RPD: 1	LCS-5	88□

□UALITY CONTROL PAHs in Soil	UNITS	P□L	METHOD	Blank	Duplicate Sm□	Duplicate results Base II Duplicate II □ RPD	Spike Sm□	Spike □ Recovery
Date extracted	-			12/05/2017	166525-1	12/05/2017 □□12/05/2017	LCS-5	12/05/2017
Date analysed	-			12/05/2017	166525-1	15/05/2017 □□15/05/2017	LCS-5	12/05/2017
Naphthalene	mg/kg	0.1	Org-012	□0.1	166525-1	□0.1 □□0.1	LCS-5	107□
Acenaphthylene	mg/kg	0.1	Org-012	□0.1	166525-1	□0.1 □□0.1	□NR□	□NR□
Acenaphthene	mg/kg	0.1	Org-012	□0.1	166525-1	□0.1 □□0.1	□NR□	□NR□
Fluorene	mg/kg	0.1	Org-012	□0.1	166525-1	□0.1 □□0.1	LCS-5	104□
Phenanthrene	mg/kg	0.1	Org-012	□0.1	166525-1	□0.1 □□0.1	LCS-5	107□
Anthracene	mg/kg	0.1	Org-012	□0.1	166525-1	□0.1 □□0.1	□NR□	□NR□
Fluoranthene	mg/kg	0.1	Org-012	□0.1	166525-1	□0.1 □□0.1	LCS-5	112□
Pyrene	mg/kg	0.1	Org-012	□0.1	166525-1	□0.1 □□0.1	LCS-5	111□
Benzo(a)anthracene	mg/kg	0.1	Org-012	□0.1	166525-1	□0.1 □□0.1	□NR□	□NR□
Chrysene	mg/kg	0.1	Org-012	□0.1	166525-1	□0.1 □□0.1	LCS-5	99□
Benzo(b,j □k)fluoranthene	mg/kg	0.2	Org-012	□0.2	166525-1	□0.2 □□0.2	□NR□	□NR□

□UALITY CONTROL PAHs in Soil	UNITS	P□L	METHOD	Blank	Duplicate Sm□	Duplicate results Base II Duplicate II □ RPD	Spike Sm□	Spike □ Recovery
Benzo(a)pyrene	mg/kg	0.05	Org-012	□0.05	166525-1	□0.05 □□□0.05	LCS-5	83□
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
Surrogate p-Terphenyl-d14	□		Org-012	80	166525-1	85 □81 □RPD: 5	LCS-5	112□

□UALITY CONTROL Organochlorine Pesticides in soil	UNITS	P□L	METHOD	Blank	Duplicate Sm□	Duplicate results Base II Duplicate II □ RPD	Spike Sm□	Spike □ Recovery
Date extracted	-			12/05/2017	166525-1	12/05/2017 □12/05/2017	LCS-5	12/05/2017
Date analysed	-			12/05/2017	166525-1	12/05/2017 □12/05/2017	LCS-5	12/05/2017
HCB	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
alpha-BHC	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	LCS-5	103□
gamma-BHC	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
beta-BHC	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	LCS-5	94□
Heptachlor	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	LCS-5	105□
delta-BHC	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
Aldrin	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	LCS-5	91□
Heptachlor Epoxide	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	LCS-5	102□
gamma-Chlordane	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
alpha-chlordane	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
Endosulfan I	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
pp-DDE	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	LCS-5	114□
Dieldrin	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	LCS-5	106□
Endrin	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	LCS-5	111□
pp-DDD	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	LCS-5	108□
Endosulfan II	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
pp-DDT	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
Endrin Aldehyde	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
Endosulfan Sulphate	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	LCS-5	104□
Methoxychlor	mg/kg	0.1	Org-005	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
Surrogate TCM□	□		Org-005	91	166525-1	86 □87 □RPD: 1	LCS-5	110□

□UALITY CONTROL PCBs in Soil	UNITS	P□L	METHOD	Blank	Duplicate Sm□	Duplicate results Base II Duplicate II □ RPD	Spike Sm□	Spike □ Recovery
Date extracted	-			12/05/2017	166525-1	12/05/2017 □□12/05/2017	LCS-5	12/05/2017
Date analysed	-			12/05/2017	166525-1	12/05/2017 □□12/05/2017	LCS-5	12/05/2017
Aroclor 1016	mg/kg	0.1	Org-006	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
Aroclor 1221	mg/kg	0.1	Org-006	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
Aroclor 1232	mg/kg	0.1	Org-006	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
Aroclor 1242	mg/kg	0.1	Org-006	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
Aroclor 1248	mg/kg	0.1	Org-006	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
Aroclor 1254	mg/kg	0.1	Org-006	□0.1	166525-1	□0.1 □□□0.1	LCS-5	101□
Aroclor 1260	mg/kg	0.1	Org-006	□0.1	166525-1	□0.1 □□□0.1	□NR□	□NR□
Surrogate TCLM□	□		Org-006	91	166525-1	86 □87 □RPD: 1	LCS-5	86□

□UALITY CONTROL Acid Extractable metals in soil	UNITS	P□L	METHOD	Blank	Duplicate Sm□	Duplicate results Base II Duplicate II □ RPD	Spike Sm□	Spike □ Recovery
Date prepared	-			12/05/2017	166525-1	12/05/2017 □□12/05/2017	LCS-5	12/05/2017
Date analysed	-			12/05/2017	166525-1	12/05/2017 □□12/05/2017	LCS-5	12/05/2017
Arsenic	mg/kg	4	Metals-020	□4	166525-1	4 □5 □RPD: 22	LCS-5	109□
Cadmium	mg/kg	0.4	Metals-020	□0.4	166525-1	□0.4 □□□0.4	LCS-5	102□
Chromium	mg/kg	1	Metals-020	□1	166525-1	38 □50 □RPD: 27	LCS-5	105□
Copper	mg/kg	1	Metals-020	□1	166525-1	5 □4 □RPD: 22	LCS-5	105□
Lead	mg/kg	1	Metals-020	□1	166525-1	8 □11 □RPD: 32	LCS-5	98□
Mercury	mg/kg	0.1	Metals-021	□0.1	166525-1	□0.1 □□□0.1	LCS-5	106□
Nickel	mg/kg	1	Metals-020	□1	166525-1	2 □2 □RPD: 0	LCS-5	97□
□inc	mg/kg	1	Metals-020	□1	166525-1	3 □3 □RPD: 0	LCS-5	98□

□UALITY CONTROL Misc Soil - Inorg	UNITS	P□L	METHOD	Blank	Duplicate Sm□	Duplicate results Base II Duplicate II □ RPD	Spike Sm□	Spike □ Recovery
Date prepared	-			12/05/2017	□NT□	□NT□	LCS-1	12/05/2017
Date analysed	-			12/05/2017	□NT□	□NT□	LCS-1	12/05/2017
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	□5	□NT□	□NT□	LCS-1	98□

□UALITY CONTROL VOCs in soil	UNITS	Dup. Sm□	Duplicate Base □Duplicate □□ RPD	Spike Sm□	Spike □ Recovery
Date extracted	-	□NT□	□NT□	166525-1	12/05/2017
Date analysed	-	□NT□	□NT□	166525-1	12/05/2017
Dichlorodifluoromethane	mg/kg	□NT□	□NT□	□NR□	□NR□
Chloromethane	mg/kg	□NT□	□NT□	□NR□	□NR□
Vinyl Chloride	mg/kg	□NT□	□NT□	□NR□	□NR□
Bromomethane	mg/kg	□NT□	□NT□	□NR□	□NR□
Chloroethane	mg/kg	□NT□	□NT□	□NR□	□NR□
Trichlorofluoromethane	mg/kg	□NT□	□NT□	□NR□	□NR□

Client Reference: □2□□2□Penrith

□UALITY CONTROL VOCs in soil	UNITS	Dup. Sm□	Duplicate Base □Duplicate □□ RPD	Spike Sm□	Spike □ Recovery
1,1-Dichloroethene	mg/kg	□NT□	□NT□	□NR□	□NR□
trans-1,2-dichloroethene	mg/kg	□NT□	□NT□	□NR□	□NR□
1,1-dichloroethane	mg/kg	□NT□	□NT□	166525-1	98□
cis-1,2-dichloroethene	mg/kg	□NT□	□NT□	□NR□	□NR□
bromochloromethane	mg/kg	□NT□	□NT□	□NR□	□NR□
chloroform	mg/kg	□NT□	□NT□	166525-1	103□
2,2-dichloropropane	mg/kg	□NT□	□NT□	□NR□	□NR□
1,2-dichloroethane	mg/kg	□NT□	□NT□	166525-1	113□
1,1,1-trichloroethane	mg/kg	□NT□	□NT□	166525-1	110□
1,1-dichloropropene	mg/kg	□NT□	□NT□	□NR□	□NR□
Cyclohexane	mg/kg	□NT□	□NT□	□NR□	□NR□
carbon tetrachloride	mg/kg	□NT□	□NT□	□NR□	□NR□
Benzene	mg/kg	□NT□	□NT□	□NR□	□NR□
dibromomethane	mg/kg	□NT□	□NT□	□NR□	□NR□
1,2-dichloropropane	mg/kg	□NT□	□NT□	□NR□	□NR□
trichloroethene	mg/kg	□NT□	□NT□	166525-1	92□
bromodichloromethane	mg/kg	□NT□	□NT□	166525-1	118□
trans-1,3-dichloropropene	mg/kg	□NT□	□NT□	□NR□	□NR□
cis-1,3-dichloropropene	mg/kg	□NT□	□NT□	□NR□	□NR□
1,1,2-trichloroethane	mg/kg	□NT□	□NT□	□NR□	□NR□
Toluene	mg/kg	□NT□	□NT□	□NR□	□NR□
1,3-dichloropropane	mg/kg	□NT□	□NT□	□NR□	□NR□
dibromochloromethane	mg/kg	□NT□	□NT□	166525-1	131□
1,2-dibromoethane	mg/kg	□NT□	□NT□	□NR□	□NR□
tetrachloroethene	mg/kg	□NT□	□NT□	166525-1	109□
1,1,1,2-tetrachloroethane	mg/kg	□NT□	□NT□	□NR□	□NR□
chlorobenzene	mg/kg	□NT□	□NT□	□NR□	□NR□
Ethylbenzene	mg/kg	□NT□	□NT□	□NR□	□NR□
bromoform	mg/kg	□NT□	□NT□	□NR□	□NR□
m□p-xylene	mg/kg	□NT□	□NT□	□NR□	□NR□
styrene	mg/kg	□NT□	□NT□	□NR□	□NR□
1,1,2,2-tetrachloroethane	mg/kg	□NT□	□NT□	□NR□	□NR□
o-□ylene	mg/kg	□NT□	□NT□	□NR□	□NR□
1,2,3-trichloropropane	mg/kg	□NT□	□NT□	□NR□	□NR□
isopropylbenzene	mg/kg	□NT□	□NT□	□NR□	□NR□
bromobenzene	mg/kg	□NT□	□NT□	□NR□	□NR□
n-propyl benzene	mg/kg	□NT□	□NT□	□NR□	□NR□
2-chlorotoluene	mg/kg	□NT□	□NT□	□NR□	□NR□
4-chlorotoluene	mg/kg	□NT□	□NT□	□NR□	□NR□
1,3,5-trimethyl benzene	mg/kg	□NT□	□NT□	□NR□	□NR□
tert-butyl benzene	mg/kg	□NT□	□NT□	□NR□	□NR□
1,2,4-trimethyl benzene	mg/kg	□NT□	□NT□	□NR□	□NR□

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

□UALITY CONTROL VOCs in soil	UNITS	Dup. Sm□	Duplicate Base □Duplicate □□ RPD	Spike Sm□	Spike □ Recovery
1,3-dichlorobenzene	mg/kg	□NT□	□NT□	□NR□	□NR□
sec-butyl benzene	mg/kg	□NT□	□NT□	□NR□	□NR□
1,4-dichlorobenzene	mg/kg	□NT□	□NT□	□NR□	□NR□
4-isopropyl toluene	mg/kg	□NT□	□NT□	□NR□	□NR□
1,2-dichlorobenzene	mg/kg	□NT□	□NT□	□NR□	□NR□
n-butyl benzene	mg/kg	□NT□	□NT□	□NR□	□NR□
1,2-dibromo-3-chloropropane	mg/kg	□NT□	□NT□	□NR□	□NR□
1,2,4-trichlorobenzene	mg/kg	□NT□	□NT□	□NR□	□NR□
hexachlorobutadiene	mg/kg	□NT□	□NT□	□NR□	□NR□
1,2,3-trichlorobenzene	mg/kg	□NT□	□NT□	□NR□	□NR□
Surrogate Dibromofluorometha	□	□NT□	□NT□	166525-1	113□
Surrogate aaa-Trifluorotoluene	□	□NT□	□NT□	166525-1	97□
Surrogate Toluene-d_8	□	□NT□	□NT□	166525-1	96□
Surrogate 4-Bromofluorobenzene	□	□NT□	□NT□	166525-1	101□

□UALITY CONTROL vTRH(C6-C10)/BTE□N in Soil	UNITS	Dup. Sm□	Duplicate Base □Duplicate □□ RPD	Spike Sm□	Spike □ Recovery
Date extracted	-	□NT□	□NT□	166525-1	12/05/2017
Date analysed	-	□NT□	□NT□	166525-1	12/05/2017
TRHC_6 - C_9	mg/kg	□NT□	□NT□	166525-1	98□
TRHC_6 - C_{10}	mg/kg	□NT□	□NT□	166525-1	98□
Benzene	mg/kg	□NT□	□NT□	166525-1	86□
Toluene	mg/kg	□NT□	□NT□	166525-1	95□
Ethylbenzene	mg/kg	□NT□	□NT□	166525-1	94□
m□p-xylene	mg/kg	□NT□	□NT□	166525-1	108□
o-□ylene	mg/kg	□NT□	□NT□	166525-1	91□
naphthalene	mg/kg	□NT□	□NT□	□NR□	□NR□
Surrogate aaa-Trifluorotoluene	□	□NT□	□NT□	166525-1	97□

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

□UALITY CONTROL svTRH (C10-C40) in Soil	UNITS	Dup. Sm□	Duplicate Base □Duplicate □□ RPD	Spike Sm□	Spike □ Recovery
Date extracted	-	□NT□	□NT□	166525-1	12/05/2017
Date analysed	-	□NT□	□NT□	166525-1	13/05/2017
TRHC$_{10}$ - C$_{14}$	mg/kg	□NT□	□NT□	166525-1	107□
TRHC$_{15}$ - C$_{28}$	mg/kg	□NT□	□NT□	166525-1	100□
TRHC$_{29}$ - C$_{36}$	mg/kg	□NT□	□NT□	166525-1	83□
TRH □C$_{10}$-C$_{16}$	mg/kg	□NT□	□NT□	166525-1	107□
TRH □C$_{16}$-C$_{34}$	mg/kg	□NT□	□NT□	166525-1	100□
TRH □C$_{34}$-C$_{40}$	mg/kg	□NT□	□NT□	166525-1	83□
Surrogate o-Terphenyl	□	□NT□	□NT□	166525-1	92□
□UALITY CONTROL PAHs in Soil	**UNITS**	**Dup. Sm□**	**Duplicate Base □Duplicate □□ RPD**	**Spike Sm□**	**Spike □ Recovery**
Date extracted	-	□NT□	□NT□	166525-1	12/05/2017
Date analysed	-	□NT□	□NT□	166525-1	12/05/2017
Naphthalene	mg/kg	□NT□	□NT□	166525-1	107□
Acenaphthylene	mg/kg	□NT□	□NT□	□NR□	□NR□
Acenaphthene	mg/kg	□NT□	□NT□	□NR□	□NR□
Fluorene	mg/kg	□NT□	□NT□	166525-1	104□
Phenanthrene	mg/kg	□NT□	□NT□	166525-1	107□
Anthracene	mg/kg	□NT□	□NT□	□NR□	□NR□
Fluoranthene	mg/kg	□NT□	□NT□	166525-1	113□
Pyrene	mg/kg	□NT□	□NT□	166525-1	112□
Benzo(a)anthracene	mg/kg	□NT□	□NT□	□NR□	□NR□
Chrysene	mg/kg	□NT□	□NT□	166525-1	98□
Benzo(b,j□k)fluoranthene	mg/kg	□NT□	□NT□	□NR□	□NR□
Benzo(a)pyrene	mg/kg	□NT□	□NT□	166525-1	83□
Indeno(1,2,3-c,d)pyrene	mg/kg	□NT□	□NT□	□NR□	□NR□
Dibenzo(a,h)anthracene	mg/kg	□NT□	□NT□	□NR□	□NR□
Benzo(g,h,i)perylene	mg/kg	□NT□	□NT□	□NR□	□NR□
Surrogate p-Terphenyl-d14	□	□NT□	□NT□	166525-1	110□

□UALITY CONTROL Organochlorine Pesticides in soil	UNITS	Dup. Sm□	Duplicate Base □Duplicate □□ RPD	Spike Sm□	Spike □ Recovery
Date extracted	-	□NT□	□NT□	166525-1	12/05/2017
Date analysed	-	□NT□	□NT□	166525-1	12/05/2017
HCB	mg/kg	□NT□	□NT□	□NR□	□NR□
alpha-BHC	mg/kg	□NT□	□NT□	166525-1	106□
gamma-BHC	mg/kg	□NT□	□NT□	□NR□	□NR□
beta-BHC	mg/kg	□NT□	□NT□	166525-1	96□
Heptachlor	mg/kg	□NT□	□NT□	166525-1	108□
delta-BHC	mg/kg	□NT□	□NT□	□NR□	□NR□
Aldrin	mg/kg	□NT□	□NT□	166525-1	93□
Heptachlor Epoxide	mg/kg	□NT□	□NT□	166525-1	104□
gamma-Chlordane	mg/kg	□NT□	□NT□	□NR□	□NR□
alpha-chlordane	mg/kg	□NT□	□NT□	□NR□	□NR□
Endosulfan I	mg/kg	□NT□	□NT□	□NR□	□NR□
pp-DDE	mg/kg	□NT□	□NT□	166525-1	117□
Dieldrin	mg/kg	□NT□	□NT□	166525-1	109□
Endrin	mg/kg	□NT□	□NT□	166525-1	114□
pp-DDD	mg/kg	□NT□	□NT□	166525-1	110□
Endosulfan II	mg/kg	□NT□	□NT□	□NR□	□NR□
pp-DDT	mg/kg	□NT□	□NT□	□NR□	□NR□
Endrin Aldehyde	mg/kg	□NT□	□NT□	□NR□	□NR□
Endosulfan Sulphate	mg/kg	□NT□	□NT□	166525-1	106□
Methoxychlor	mg/kg	□NT□	□NT□	□NR□	□NR□
Surrogate TCM□	□	□NT□	□NT□	166525-1	112□

□UALITY CONTROL PCBs in Soil	UNITS	Dup. Sm□	Duplicate Base □Duplicate □□ RPD	Spike Sm□	Spike □ Recovery
Date extracted	-	□NT□	□NT□	166525-1	12/05/2017
Date analysed	-	□NT□	□NT□	166525-1	12/05/2017
Aroclor 1016	mg/kg	□NT□	□NT□	□NR□	□NR□
Aroclor 1221	mg/kg	□NT□	□NT□	□NR□	□NR□
Aroclor 1232	mg/kg	□NT□	□NT□	□NR□	□NR□
Aroclor 1242	mg/kg	□NT□	□NT□	□NR□	□NR□
Aroclor 1248	mg/kg	□NT□	□NT□	□NR□	□NR□
Aroclor 1254	mg/kg	□NT□	□NT□	166525-1	100□
Aroclor 1260	mg/kg	□NT□	□NT□	□NR□	□NR□
Surrogate TCLM□	□	□NT□	□NT□	166525-1	91□
□UALITY CONTROL Acid Extractable metals in soil	UNITS	Dup. Sm□	Duplicate Base □Duplicate □□ RPD	Spike Sm□	Spike □ Recovery
Date prepared	-	□NT□	□NT□	166525-2	12/05/2017
Date analysed	-	□NT□	□NT□	166525-2	12/05/2017
Arsenic	mg/kg	□NT□	□NT□	166525-2	76□
Cadmium	mg/kg	□NT□	□NT□	166525-2	82□
Chromium	mg/kg	□NT□	□NT□	166525-2	119□
Copper	mg/kg	□NT□	□NT□	166525-2	87□
Lead	mg/kg	□NT□	□NT□	166525-2	89□
Mercury	mg/kg	□NT□	□NT□	166525-2	110□
Nickel	mg/kg	□NT□	□NT□	166525-2	76□
□inc	mg/kg	□NT□	□NT□	166525-2	81□

Report Comments:

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.
This is reported outside our scope of NATA accreditation.

Asbestos ID was analysed by Approved Identifier:	Lucy □hu
Asbestos ID was authorised by Approved Signatory:	Paul Ching

INS: Insufficient sample for this test	P□L: Practical □uantitation Limit	NT: Not tested
NR: Test not required	RPD: Relative Percent Difference	NA: Test not required
□: Less than	□: Greater than	LCS: Laboratory Control Sample

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS □Laboratory Control Sample□: This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: □5xP□L - any RPD is acceptable; □5xP□L - 0-50□ RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130□ for inorganics/metals; 60-140□ for organics (□/-50□ surrogates) and 10-140□ for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory □A/□C protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 8547389
Version: 1, Version Date: 14/04/2021

ENVIROLAB

09122

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52372
PROJECT NAME: Penrith
DATE NEEDED BY:

LABORATORY BATCH NO.:
SAMPLERS: SG
QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) Rhammond@jbsg.com.au; (3) .....@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

TESTING TBA

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
1	QA20160506-1	SOIL	6/5		Bag + Jar + ice				
2	QA20160506-2		↓						
3	QC20170507-1a		7.5		Jar + Bag				
4	QC20170507-2a		"		" "				

ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 166525
Date Received: 8-5-17
Time Received: 12.30
Received by: JE
Temp: Cool/Ambient 7.3°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Saray DATE: 8/5/17 OF: JBS&G	CONSIGNMENT NOTE NO. TRANSPORT CO.	NAME: JE DATE: 8-5-17 OF: ELS	COOLER SEAL – Yes..... No ..... Intact ..... Broken ..... COOLER TEMP ..... deg C
NAME: DATE: OF:	CONSIGNMENT NOTE NO. TRANSPORT CO	NAME: DATE: OF:	COOLER SEAL – Yes..... No ..... Intact ..... Broken ..... COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

Simon Song

From: Rohan Hammond <RHammond@jbsg.com.au>
Sent: Thursday, 11 May 2017 10:04 AM
To: Simon Song
Subject: RE: Sample Receipt for 166525 52372, Penrith

Hi Simon,

Can we schedule the following analysis on 5 day TAT:

QA20170506-1: Asbestos WA, OCPs, PCBs, VOCs and Suite 4 (TRH/BTEX/PAH/8 Metals/Phenols
QA20170506-2: 8 metals

Thanks and regards,
Rohan.

#166525

From: Simon Song [mailto:SSong@envirolab.com.au]
Sent: Monday, May 8, 2017 4:43 PM
To: AdminNSW <adminNSW@jbsg.com.au>; Rohan Hammond <RHammond@jbsg.com.au>
Subject: Sample Receipt for 166525 52372, Penrith

Please refer to attached for a copy of your COC and our Sample Receipt Advice (SRA).
Please open and read the SRA as it contains important information.
Please let the lab know immediately if there are any issues.

Results will be available by 6.30pm on the date indicated.

PLEASE NOTE COMBO PRICES WILL ONLY APPLY IF COMBOS ARE SELECTED ON COC.

The new 2016-2017 Price List commences 1st November 2015 - please contact us if you don't have a copy.

Please note that subcontracted testing or non routine testing may take significantly longer than just the standard 5 day TAT, contact the lab to get an approximate due date.

Enquiries should be made directly to:

customerservice@envirolab.com.au

Regards

Envirolab Services
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
www.envirolabservices.com.au

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

549116

Enviro Sample NSW

From: Nibha Vaidya
Sent: Tuesday, 6 June 2017 11:56 AM
To: Enviro Sample NSW; COC NSW; Rupan Virk
Subject: 1 DAY TAT - FW: Eurofins | mgt Test Results - Report 548083 : Site PENRITH DSI (52372)

Additional TCLP please – 1 day TAT

Kind Regards,

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

From: Rohan Hammond [mailto:RHammond@jbsg.com.au]
Sent: Tuesday, 6 June 2017 11:25 AM
To: Nibha Vaidya
Subject: FW: Eurofins | mgt Test Results - Report 548083 : Site PENRITH DSI (52372)

Hi Nibha,

Apologies, can we change that to TCLP Lead on JHA02 0.3-0.5 and JHA02 0.1-0.2

No ASLPs required.

195 194

24 HR TAT (if possible).

Rohan.

From: Rohan Hammond
Sent: Tuesday, June 6, 2017 10:25 AM
To: 'NibhaVaidya@eurofins.com' <NibhaVaidya@eurofins.com>
Subject: RE: Eurofins | mgt Test Results - Report 548083 : Site PENRITH DSI (52372)

6/6 UL

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Melbourne
3-5 Kingston Town Close
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NATA # 1261
Site # 1254 & 14271

Sydney
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NATA # 1261 Site # 18217

Brisbane
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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 18217

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Rohan Hammond
Project name: ADDITIONAL - PENRITH DSI
Project ID: 52372
COC number: Not provided
Turn around time: 1 Day
Date/Time received: Jun 6, 2017 11:56 AM
Eurofins | mgt reference: **549116**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 10.8 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Rohan Hammond - rhammond@jbsg.com.au.

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Site # 18217

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: ADDITIONAL - PENRITH DSI
Project ID: 52372

Order No.:
Report #: 549116
Phone: 02 8245 0300
Fax:

Received: Jun 6, 2017 11:56 AM
Due: Jun 8, 2017
Priority: 1 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Lead	USA Leaching Procedure
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 18217							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	JHA02_0.3-0.5	May 26, 2017		US Leachate	S17-Jn05473	X	X
2	JHA02_0.1-0.3	May 26, 2017		US Leachate	S17-Jn05474	X	X
Test Counts						2	2

eurofins | mgt

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **549116-L**
Project name ADDITIONAL - PENRITH DSI
Project ID 52372
Received Date Jun 06, 2017

Client Sample ID			**JHA02_0.3-0.5**	**JHA02_0.1-0.3**
Sample Matrix			**US Leachate**	**US Leachate**
Eurofins | mgt Sample No.			**S17-Jn05473**	**S17-Jn05474**
Date Sampled			**May 26, 2017**	**May 26, 2017**
Test/Reference	LOR	Unit		
Heavy Metals				
Lead	0.01	mg/L	0.49	0.03
USA Leaching Procedure				
Leachate Fluid[C01]		comment	1.0	1.0
pH (initial)	0.1	pH Units	8.2	7.6
pH (off)	0.1	pH Units	5.1	5.1
pH (USA HCl addition)	0.1	pH Units	1.7	1.7

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Heavy Metals	Sydney	Jun 06, 2017	180 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
USA Leaching Procedure	Sydney	Jun 06, 2017	14 Day
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			

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Site # 18217

Company Name:	JBS & G Australia (NSW) P/L	**Order No.:**		**Received:**	Jun 6, 2017 11:56 AM
Address:	Level 1, 50 Margaret St Sydney NSW 2000	**Report #:**	549116	**Due:**	Jun 8, 2017
		Phone:	02 8245 0300	**Priority:**	1 Day
		Fax:		**Contact Name:**	Rohan Hammond
Project Name:	ADDITIONAL - PENRITH DSI				
Project ID:	52372				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Lead	USA Leaching Procedure
Melbourne Laboratory - NATA Site # 1254 & 14271							
Sydney Laboratory - NATA Site # 18217						X	X
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 18217							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	JHA02_0.3-0.5	May 26, 2017		US Leachate	S17-Jn05473	X	X
2	JHA02_0.1-0.3	May 26, 2017		US Leachate	S17-Jn05474	X	X
Test Counts						2	2

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank									
Heavy Metals									
Lead			mg/L	< 0.01			0.01	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Heavy Metals				Result 1					
Lead	S17-Jn05434	NCP	%	76			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	S17-Jn05474	CP	mg/L	0.03	0.03	3.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other

Authorised By

Nibha Vaidya	Analytical Services Manager
Ryan Hamilton	Senior Analyst-Metal (NSW)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Appendix M Detailed Quality Assurance / Quality Control Documentation

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

ESDAT QA Checker
Project:52372
Filter: ALL

Overview Summary
- Count of Samples
- Summary By Compound
- Count of Results

Holding Times
- Holding Time Errors (1271)

Blanks
- Field Blanks
- Detects in Lab Blanks (4)
- SDG's without Storage Blanks (0)
- SDG's without Method Blanks (0)

Duplicates
- Field and Interlab Duplicates
- Lab Duplicates with high RPDs (0)
- Duplicate Samples with incorrect or missing Parent Samples (0)
- Samples at the same Location/Depth/Time not specified as duplicates (0)

Surrogates
- Surrogate Variation > 30% or outside lab LCL or UCL (26)

Lab Control Samples
- SDG's without a Laboratory Control Sample (0)
- Laboratory Control Samples, Error > 30% (2)

Certified and Standard Reference Materials
- Certified Reference Materials - Error > 30% (0)

Matrix Spikes
- SDG's without a Matrix Spike (0)
- Trip Spikes with invalid Control Sample (0)
- Less than 1 matrix spike in 20 samples, or less than 1 matrix duplicate in 20 samples (0)
- Matrix Spike Recoveries less than 70% or greater than 130% or outside lab LCL or UCL (2)
- Trip Spike Recoveries (70% - 130% is acceptable) (12)

Inorganic
- Na + CL > TDS (0)
- BOD > COD (0)
- BOD > COD (0)

Other
- Unit Conversion Problems (0)
- OriginalChemNames Requiring Validation (0)
- Samples with no Results (0)
- Samples associated with Wells which are not specified in the Well Table (0)
- Aborted Analysis (0)

Contents

Count of Samples

Matrix Type	GAS	SOIL	WATER
First Sample Date	5/5/2017	5/6/2017	5/6/2017
Last Sample Date	5/5/2017	6/5/2017	5/26/2017
Sampling Period (days)	1	31	21
Number of Samples Submitted	24	48	14
Number of Non QA Samples Submitted	20	42	6
Number of Field Blanks	2	0	0
Number of Trip Blanks	0	0	2
Number of Rinsates	0	0	3
Number of Field Duplicates	2	3	2
Number of Trip Spikes	0	0	2
Number of Lab Duplicates	0	12	3
Number of LCSs	1	23	18
Number of CRMs	0	0	0
Number of Method Blanks	2	18	14
Number of Storage Blanks	0	0	0
Number of Matrix Spikes	0	23	7
Number of Matrix Spike Dupes	0	0	0

Filter: ALL

			Num Results	Holding Times (days)				Lab Control Samples			Method and Storage Blanks			Laboratory Duplicates			Surrogates			Matrix,Trip and Compound Spikes			Field,Rinsate and Trip Blanks			Field Duplicates		
Chem_Group	ChemName	Range	Non QA (Normal + Composite)	Volatility Group	Sample to Extraction	Sample to Analysis	Acceptable	Recovery %	Num Reported	Acceptable	Range	Num Reported	Acceptable	Max RPD > EQL x 1	Num Reported	Acceptable	Recovery %	Num Reported	Acceptable	Recovery %	Num Reported	Acceptable	Range	Num Reported	Acceptable	Max RPD > EQL x 1	Num Reported	Acceptable
BTEX	Benzene		20	VOC	5	12	Y	115 to 115	1	Y		0			0	N		0			0			0			2	Y
	Ethylbenzene		20	VOC	5	12	Y	89 to 89	1	Y		0			0	N		0			0			0			2	Y
	Toluene		20	VOC	5	12	Y	92 to 92	1	Y		0			0	N		0			0			0			2	Y
	Xylene (Total)		20	VOC	5	12	Y	94 to 94	1	Y		0			0	N		0			0			0			2	Y
Chlorinated Alkanes	1,1,1,2-tetrachloroethane		20	VOC	5	12	Y		0			0			0	N		0			0			0			2	Y
	1,1,1-trichloroethane		20	VOC	5	12	Y		0			0			0	N		0			0			0			2	Y
	1,1,2,2-tetrachloroethane		20	VOC	5	12	Y		0			0			0	N		0			0			0			2	Y
	1,1,2-trichloroethane		20	VOC	5	12	Y		0			0			0	N		0			0			0			2	Y
	1,1-dichloroethane		20	VOC	5	12	Y		0			0			0	N		0			0			0			2	Y
	1,2,3-trichloropropane		20	VOC	5	12	Y		0			0			0	N		0			0			0			2	Y
	1,2-dibromo-3-chloropropane		20	VOC	5	12	Y		0			0			0	N		0			0			0			2	Y
	1,2-dichloroethane		20	VOC	5	12	Y		0			0			0	N		0			0			0			2	Y
	1,2-dichloropropane		20	VOC	5	12	Y		0			0			0	N		0			0			0			2	Y
	1,3-dichloropropane		20	VOC	5	12	Y		0			0			0	N		0			0			0			2	Y
	2,2-dichloropropane		20	VOC	5	12	Y		0			0			0	N		0			0			0			2	Y
	Bromochloromethane		20	Other	5	12	Y		0			0			0	N		0			0			0			2	Y
	Carbon tetrachloride		20	VOC	5	12	Y		0			0			0	N		0			0			0			2	Y
	Trichlorofluoromethane		20	VOC	5	12	Y		0			0			0	N		0			0			0			2	Y
Chlorinated Alkenes	1,1-dichloroethene		20	VOC	5	12	Y		0			0			0	N		0			0			0			2	Y
	1,1-dichloropropene		20	VOC	5	12	Y		0			0			0	N		0			0			0			2	Y
	2-chlorotoluene		20	VOC	5	12	Y		0		ND	5	Y		0	N		0			0			0			2	Y
	4-chlorotoluene		20	VOC	5	12	Y		0		ND	5	Y		0	N		0			0			0			2	Y
	cis-1,2-dichloroethene		20	VOC	5	12	Y		0		ND	5	Y		0	N		0			0			0			2	Y
	cis-1,3-dichloropropene		20	VOC	5	12	Y		0		ND	5	Y		0	N		0			0			0			2	Y
	Tetrachloroethene		20	SVOC	5	12	Y		0		ND	5	Y		0	N		0			0			0			2	Y
	trans-1,3-dichloropropene		20	VOC	5	12	Y		0		ND	4	Y		0	N		0			0			0			2	Y
	Trichloroethene		20	VOC	5	12	Y	104 to 104	1	Y	ND	3	Y		0	N		0			0			0			2	Y
	Vinyl Chloride		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
Chlorinated Benzenes	1,2,3-trichlorobenzene		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
	1,2,4-trichlorobenzene		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
	1,2-Dichlorobenzene		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
	1,3-dichlorobenzene		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
	1,4-dichlorobenzene		20	VOC	5	12	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Chlorobenzene		20	Other	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
Miscellaneous Hydrocarbons	1,2-dibromoethane		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
	Dibromomethane		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
Miscellaneous Industrial Chemicals	Hexachlorobutadiene		20	VOC	5	12	Y		0		ND	1	Y		0	N		0			0			0			2	Y
Monocyclic Aromatic Hydrocarbons	1,2,4-trimethyl benzene		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
	1,3,5-trimethyl benzene		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
	4-isopropyl toluene		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
	Isopropylbenzene		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
	n-butyl benzene		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
	n-propyl benzene		20	VOC	5	12	Y		0		ND	2	Y		0	N		0			0			0			2	Y
	sec-butyl benzene		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
	Styrene		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
	Tert-butyl benzene		20	VOC	5	12	Y		0		ND	1	Y		0	N		0			0			0			2	Y
Organic Alcohols	Isopropyl alcohol		20	VOC	5	12	Y		0		ND	1	Y		0	N		0			0			0			2	Y
Polycyclic Aromatic Hydrocarbons	Naphthalene		20	VOC	5	12	Y	100 to 100	1	Y	ND	2	Y		0	N		0			0			0			2	Y
Surrogate	Fluorobenzene (surr.)		0	SVOC			Y		0		ND	3	Y		0	N	111 to 132	24	N		0			0			0	N
	Surrogate 4-BFB		0	VOC			Y		0		ND	3	Y		0	N	90 to 106	24	Y		0			0			0	N
	Surrogate Dibromofluoromethane		0	VOC			Y		0		ND	3	Y		0	N	99 to 116	24	Y		0			0			0	N
TRHs (NEPC 2013)	>C10-C16 Fraction		6	SVOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
	C6-C10 Fraction		6	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
Trihalomethanes	Bromodichloromethane		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
	Chloroform		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
	Dibromochloromethane		20	VOC	5	12	Y		0		ND	3	Y		0	N		0			0			0			2	Y
	Tribromomethane		20	VOC	5	12	Y		0		ND	1	Y		0	N		0			0			0			2	Y
Asbestos	Approx. Sample Mass		20	Other	3 to 11	10 to 11	Y		0		ND	1	Y		0	N		0			0			0			1	Y
	Asbestos from ACM in Soil		20	Other	3 to 11	10 to 11	Y		0		ND	3	Y		0	N		0			0			0			1	Y
	Asbestos from FA & AF in Soil		20	Other	3 to 11	10 to 11	Y		0		ND	3	Y		0	N		0			0			0			1	Y
Asbestos	Asbestos ID in Soil		0	Other	-20	-20	N		0		ND	3	Y		0	N		0			0			0			0	N
Asbestos	Mass ACM		20	Other	3 to 11	10 to 11	Y		0		ND	3	Y		0	N		0			0			0			1	Y
	Mass AF		20	Other	3 to 11	10 to 11	Y		0		ND	3	Y		0	N		0			0			0			1	Y
	Mass Asbestos in ACM		20	Other	3 to 11	10 to 11	Y		0			0			0	N		0			0			0			1	Y
	Mass Asbestos in AF		20	Other	3 to 11	10 to 11	Y		0			0			0	N		0			0			0			1	Y
	Mass Asbestos in FA		20	Other	3 to 11	10 to 11	Y		0			0			0	N		0			0			0			1	Y
	Mass Asbestos in FA & AF		20	Other	3 to 11	10 to 11	Y		0			0			0	N		0			0			0			1	Y
	Mass FA		20	Other	3 to 11	10 to 11	Y		0			0			0	N		0			0			0			1	Y
Asbestos - Trace Analysis	ACM - Comment		20	Other	3 to 11	10 to 11	Y		0			0			0	N		0			0			0			1	Y
	AF - Comment		20	Other	3 to 11	10 to 11	Y		0		ND	3	Y		0	N		0			0			0			1	Y
	FA - Comment		20	Other	3 to 11	10 to 11	Y		0		ND	3	Y		0	N		0			0			0			1	Y
	Organic Fibres - Comment		20	Other	3 to 11	10 to 11	Y		0		ND	3	Y		0	N		0			0			0			1	Y
	Respirable Fibres - Comment		20	Other	3 to 11	10 to 11	Y		0		ND	3	Y		0	N		0			0			0			1	Y
	Synthetic Fibres - Comment		20	Other	3 to 11	10 to 11	Y		0		ND	4	Y		0	N		0			0			0			1	Y
Asbestos ID - soils NEPM	ACM >7mm Estimatio[n^]		0	Other		-20	N		0		ND	3	Y		0	N		0			0			0			0	N
	FA and AF Estimatio[n^#2]		0	Other		-20	N		0		ND	3	Y		0	N		0			0			0			0	N
	Total Asbestos#1		0	Other		-20	N		0		ND	3	Y		0	N		0			0			0			0	N
BTEX	Benzene	0.1 mg/kg	24	VOC	6 to 183	10 to 183	N	81 to 114	3	Y	ND	3	Y		2	Y		0		77 to 119	3	Y		0			1	Y
	Ethylbenzene	0.1 mg/kg	24	VOC	6 to 183	10 to 183	N	94 to 106	3	Y	ND	2	Y		2	Y		0		93 to 122	3	Y		0			1	Y
	Toluene	0.1 mg/kg	24	VOC	6 to 183	10 to 183	N	88 to 129	3	Y	ND	2	Y		2	Y		0		84 to 117	3	Y		0			1	Y
	Xylene (m & p)	0.2 mg/kg	24	VOC	6 to 183	10 to 183	N	90 to 112	3	Y	ND	3	Y		2	Y		0		94 to 123	3	Y		0			1	Y
	Xylene (o)	0.1 mg/kg	24	VOC	6 to 183	10 to 183	N	95 to 109	3	Y	ND	1	Y		2	Y		0		91 to 125	3	Y		0			1	Y

Filter: ALL

	Xylene (Total)	0.3 mg/kg	24	VOC	6 to 183	10 to 183	N	74 to 92	2	Y	ND	3	Y		1	Y		0		88 to 95	2	Y		0			2	Y
Chlorinated Alkanes	1,1,1,2-tetrachloroethane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	95 to 122	2	Y	ND	2	Y		3	Y		0		103 to 119	2	Y		0			2	Y
	1,1,1-trichloroethane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	93 to 122	3	Y	ND	1	Y		3	Y		0		110 to 129	3	Y		0			2	Y
	1,1,2,2-tetrachloroethane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	87 to 100	2	Y	ND	3	Y		3	Y		0		87 to 114	2	Y		0			2	Y
	1,1,2-trichloroethane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	112 to 116	2	Y	ND	3	Y		3	Y		0		115 to 116	2	Y		0			2	Y
	1,1-dichloroethane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	97 to 124	3	Y	ND	1	Y		3	Y		0		93 to 111	3	Y		0			2	Y
	1,2,3-trichloropropane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	107 to 119	2	Y	ND	3	Y		3	Y		0		113 to 127	2	Y		0			2	Y
	1,2-dibromo-3-chloropropane		0	VOC	183	183	N		0		ND	3	Y		1	Y		0			0			0			0	N
	1,2-dichloroethane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	111 to 130	3	N	ND	1	Y		3	Y		0		109 to 123	3	Y		0			2	Y
	1,2-dichloropropane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	103 to 113	2	Y	ND	1	Y		3	Y		0		96 to 109	2	Y		0			2	Y
	1,3-dichloropropane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	111 to 113	2	Y	ND	1	Y		3	Y		0		112 to 112	2	Y		0			2	Y
	2,2-dichloropropane		0	VOC	183	183	N		0		ND	3	Y		1	Y		0			0			0			0	N
	Bromochloromethane	0.5 mg/kg	15	Other	6 to 183	10 to 183	N	71 to 112	2	Y	ND	1	Y		3	Y		0		108 to 123	2	Y		0			2	Y
	Carbon tetrachloride	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	92 to 129	2	Y	ND	2	Y		3	Y		0		112 to 129	2	Y		0			2	Y
	Chloroethane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	70 to 70	1	N	ND	3	Y		3	Y		0		72 to 104	2	Y		0			2	Y
	Chloromethane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	83 to 84	2	Y	ND	3	Y		3	Y		0		71 to 78	2	Y		0			2	Y
	Dichlorodifluoromethane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	83 to 124	2	Y	ND	3	Y		3	Y		0		70 to 115	2	N		0			2	Y
	Dichloromethane	0.5 mg/kg	15	SVOC	6 to 10	10 to 11	N	81 to 116	2	Y	ND	1	Y		2	Y		0		110 to 123	2	Y		0			2	Y
	Trichlorofluoromethane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	79 to 119	2	Y	ND	3	Y		3	Y		0		87 to 113	2	Y		0			2	Y
Chlorinated Alkenes	1,1-dichloroethene	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	81 to 105	2	Y	ND	2	Y		3	Y		0		102 to 128	2	Y		0			2	Y
	1,1-dichloropropene		0	VOC	183	183	N		0		ND	3	Y		1	Y		0			0			0			0	N
	2-chlorotoluene		0	VOC	183	183	N		0		ND	3	Y		1	Y		0			0			0			0	N
	3-chloropropene	0.5 mg/kg	15	SVOC	6 to 10	10 to 11	N	73 to 129	2	Y	ND	1	Y		2	Y		0		82 to 121	2	Y		0			2	Y
	4-chlorotoluene	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	114 to 115	2	Y	ND	3	Y		3	Y		0		103 to 114	2	Y		0			2	Y
	cis-1,2-dichloroethene	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	106 to 124	2	Y	ND	3	Y		3	Y		0		93 to 125	2	Y		0			2	Y
	cis-1,3-dichloropropene	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	102 to 119	2	Y	ND	3	Y		3	Y		0		98 to 127	2	Y		0			2	Y
	Tetrachloroethene	0.5 mg/kg	15	SVOC	6 to 183	10 to 183	N	108 to 128	3	Y	ND	3	Y		3	Y		0		90 to 127	3	Y		0			2	Y
	trans-1,2-dichloroethene	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	124 to 126	2	Y	ND	3	Y		1	Y		0		86 to 126	2	Y		0			2	Y
	trans-1,3-dichloropropene	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	102 to 113	2	Y	ND	3	Y		3	Y		0		96 to 110	2	Y		0			2	Y
	Trichloroethene	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	94 to 126	3	Y	ND	3	Y		3	Y		0		92 to 115	3	Y		0			2	Y
	Vinyl Chloride	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	84 to 100	2	Y	ND	2	Y		1	Y		0		99 to 99	1	Y		0			2	Y
Chlorinated Benzenes	1,2,3-trichlorobenzene		0	VOC	183	183	N		0		ND	1	Y		1	Y		0			0			0			0	N
	1,2,4-trichlorobenzene		0	VOC	183	183	N		0		ND	3	Y		1	Y		0			0			0			0	N
	1,2-Dichlorobenzene	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	113 to 119	2	Y	ND	3	Y		3	Y		0		113 to 115	2	Y		0			2	Y
	1,3-dichlorobenzene	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	114 to 123	2	Y	ND	3	Y		3	Y		0		114 to 114	2	Y		0			2	Y
	1,4-dichlorobenzene	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	112 to 121	2	Y	ND	3	Y		3	Y		0		111 to 113	2	Y		0			2	Y
	Chlorobenzene	0.5 mg/kg	15	Other	6 to 183	10 to 183	N	90 to 117	2	Y	ND	2	Y		3	Y		0		89 to 101	2	Y		0			2	Y
	Hexachlorobenzene	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	71 to 100	2	Y	ND	1	Y		1	Y		0		91 to 116	2	Y		0			1	Y
Ionic Balance	Cation Exchange Capacity	0.05 meq/100g	4	Other	10 to 11	10 to 11	Y		0			0			0	N		0			0			0			0	N
	EC 1:5 soil:water	10 µS/cm	4	Other	9 to 10	10 to 11	Y		0			0			0	N		0			0			0			0	N
	pH (TCLP - HCl addition)	0.1 ph Units	2	other	11	12	Y		0		ND	1	Y		0	N		0			0			0			0	N
	pH (TCLP - initial)	0.1 ph Units	2	other	11	12	Y		0		ND	3	Y		0	N		0			0			0			0	N
	pH (TCLP - off)	0.1 ph Units	2	other	11	12	Y		0		ND	3	Y		0	N		0			0			0			0	N
	pH 1:5 soil:water	0.1 ph Units	4	Other	9 to 10	10 to 11	Y		0		ND	3	Y		0	N		0			0			0			0	N
Metals & Metalloids	Arsenic (Total)	2 mg/kg	35	Other	4 to 183	4 to 183	N	83 to 109	4	Y	ND	3	Y	22	2	Y		0		76 to 84	3	Y		0		83	3	N
	Cadmium	0.4 mg/kg	35	Other	4 to 183	4 to 183	N	84 to 102	4	Y	ND	3	Y		3	Y		0		81 to 83	3	Y		0			3	Y
	Chromium (Total)	5 mg/kg	35	Other	4 to 183	4 to 183	N	80 to 105	4	Y	ND	3	Y	27	3	Y		0		80 to 119	3	Y		0		32	3	Y
	Copper	5 mg/kg	35	Other	4 to 183	4 to 183	N	83 to 105	4	Y	ND	3	Y	22	3	Y		0		81 to 90	3	Y		0		64	3	N
	Lead	5 mg/kg	37	Other	4 to 183	4 to 183	N	87 to 99	4	Y	ND	3	Y	32	3	Y		0		76 to 90	4	Y		0		36	3	Y
	Mercury (Inorganic)	0.1 mg/kg	35	Other	4 to 183	4 to 183	N	99 to 116	4	Y	ND	3	Y		2	Y		0		81 to 110	3	Y		0			3	Y
	Nickel	5 mg/kg	35	Other	4 to 183	4 to 183	N	80 to 97	4	Y	ND	3	Y	7	3	Y		0		76 to 84	3	Y		0			3	Y
	Zinc	5 mg/kg	35	Other	4 to 183	4 to 183	N	85 to 98	4	Y	ND	3	Y	7	3	Y		0		81 to 102	3	Y		0		98	3	N
Miscellaneous Hydrocarbons	1,2-dibromoethane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	110 to 119	2	Y	ND	3	Y		3	Y		0		106 to 116	2	Y		0			2	Y
	2-Butanone (MEK)	0.5 mg/kg	15	VOC	6 to 10	10 to 11	N	80 to 90	2	Y	ND	3	Y		2	Y		0		74 to 124	2	Y		0			2	Y
	4-Methyl-2-pentanone (MIBK)	0.5 mg/kg	15	VOC	6 to 10	10 to 11	N	100 to 106	2	Y	ND	3	Y		2	Y		0		110 to 111	2	Y		0			2	Y
	Bromomethane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	75 to 75	1	Y	ND	1	Y		3	Y		0		78 to 78	1	Y		0			2	Y
	Cyclohexane		0	VOC	183	183	N		0		ND	1	Y		1	Y		0			0			0			0	N
	Dibromomethane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	112 to 118	2	Y	ND	1	Y		3	Y		0		106 to 121	2	Y		0			2	Y
	Iodomethane	0.5 mg/kg	15	VOC	6 to 10	10 to 11	N	76 to 91	2	Y	ND	2	Y		2	Y		0		81 to 118	2	Y		0			2	Y
Miscellaneous Industrial Chemicals	Hexachlorobutadiene		0	VOC	183	183	N		0		ND	3	Y		1	Y		0			0			0			0	N
Monocyclic Aromatic Hydrocarbons	1,2,4-trimethyl benzene	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	114 to 118	2	Y	ND	2	Y		3	Y		0		101 to 114	2	Y		0			2	Y
	1,3,5-trimethyl benzene	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	114 to 118	2	Y	ND	3	Y		3	Y		0		99 to 112	2	Y		0			2	Y
	4-isopropyl toluene		0	VOC	183	183	N		0		ND	3	Y		1	Y		0			0			0			0	N
	Bromobenzene	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	104 to 118	2	Y	ND	3	Y		3	Y		0		96 to 116	2	Y		0			2	Y
	Isopropylbenzene	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	88 to 116	2	Y	ND	3	Y		3	Y		0		95 to 101	2	Y		0			2	Y
	n-butyl benzene		0	VOC	183	183	N		0		ND	3	Y		1	Y		0			0			0			0	N
	n-propyl benzene		0	VOC	183	183	N		0		ND	6	Y		1	Y		0			0			0			0	N
	sec-butyl benzene		0	VOC	183	183	N		0			0			1	Y		0			0			0			0	N
	Styrene	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	84 to 114	2	Y	ND	3	Y		3	Y		0		92 to 98	2	Y		0			2	Y
	Tert-butyl benzene		0	VOC	183	183	N		0		ND	3	Y		1	Y		0			0			0			0	N
Organic Sulfur Compounds	Carbon disulfide	0.5 mg/kg	15	VOC	6 to 10	10 to 11	N	78 to 122	2	Y	ND	1	Y		2	Y		0		108 to 108	1	Y		0			2	Y
Organochlorine Pesticides	4,4-DDE	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	86 to 114	3	Y	ND	2	Y		1	Y		0		87 to 118	3	Y		0			1	Y
	Aldrin	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	81 to 98	3	Y		0			1	Y		0		88 to 109	3	Y		0			1	Y
	alpha-BHC	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	85 to 103	3	Y		0			1	Y		0		86 to 106	3	Y		0			1	Y
	alpha-Chlordane		0	SVOC	183	183	N		0			0			1	Y		0			0			0			0	N
	beta-BHC	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	71 to 94	3	Y		0			1	Y		0		80 to 96	3	Y		0			1	Y
	Chlordane	0.1 mg/kg	9	SVOC	6 to 10	10 to 11	N	78 to 92	2	Y		0			0	N		0		85 to 99	2	Y		0			1	Y
	DDD	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	89 to 108	3	Y		0			1	Y		0		100 to 125	3	Y		0			1	Y
	DDT	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	85 to 87	2	Y		0			1	Y		0		78 to 82	2	Y		0			1	Y
	DDT+DDE+DDD (Sum of Total)		0	SVOC	183	183	N		0			0			1	Y		0			0			0			1	Y
	delta-BHC	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	91 to 100	2	Y		0			1	Y		0		92 to 111	2	Y		0			1	Y
	Dieldrin	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	76 to 106	3	Y		0			1	Y		0		84 to 109	3	Y		0			1	Y
	Endosulfan alpha	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	76 to 90	2	Y	ND	3	Y		1	Y		0		85 to 95	2	Y		0			1	Y
	Endosulfan beta	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	77 to 88	2	Y		0			1	Y		0		77 to 91	2	Y		0			1	Y
	Endosulfan sulphate	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	80 to 104	3	Y	ND	3	Y		1	Y		0		94 to 106	3	Y		0			1	Y
	Endrin	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	72 to 111	3	Y	ND	3	Y		1	Y		0		92 to 114	3	Y		0			1	Y
	Endrin aldehyde	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	74 to 75	2	Y	ND	3	Y		1	Y		0		79 to 93	2	Y		0			1	Y
	Endrin ketone	0.05 mg/kg	9	SVOC	6 to 10	10 to 11	N	73 to 89	2	Y	ND	3	Y		0	N		0		76 to 98	2	Y		0			1	Y
	gamma-Chlordane		0	SVOC	183	183	N		0			0			1	Y		0			0			0			0	N
	Heptachlor	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	85 to 105	3	Y	ND	1	Y		1	Y		0		51 to 108	3	N		0			1	Y
	Heptachlor Epoxide	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	82 to 102	2	Y	ND	3	Y		1	Y		0		82 to 130	3	N		0			1	Y
	Lindane	0.05 mg/kg	9	SVOC	6 to 183	10 to 183	N	70 to 91	2	N	ND	3	Y		1	Y		0		77 to 80	2	Y		0			1	Y
	Methoxychlor	0.2 mg/kg	9	SVOC	6 to 183	10 to 183	N	86 to 107	2	Y	ND	3	Y		1	Y		0		83 to 92	2	Y		0			1	Y
	Toxaphene	1 mg/kg	9	SVOC	6 to 10	10 to 11	N	88 to 101	2	Y		0			0	N		0		89 to 108	2	Y		0			1	Y
Other	% Clay	1 %	4	Other	9 to 10	10 to 11	Y	100 to 100	1	Y	ND	3	Y	0	1	Y		0			0			0			0	N
	% Moisture 103oC	1 %	40	Other	3 to 4	10 to 11	Y		0		ND	3	Y	6	3	Y		0			0			0		45	3	Y

Filter: ALL

	Moisture		0	Other	4 to 183	-21 to 5	N		0		ND	3	Y		0	N		0			0			0			0	N
PAHs in Soil	Benzo(b,j+k)fluoranthene		0	Other	183	-21	N		0		ND	3	Y		1	Y		0			0			0			0	N
Phenols	Phenols (Total)	0.1 mg/kg	20	SVOC	7 to 183	10 to 183	N	87 to 101	3	Y	ND	5	Y		1	Y		0		102 to 102	1	Y	ND	5	Y		1	Y
Polychlorinated Biphenyls	Aroclor 1016	0.5 mg/kg	9	SVOC	6 to 183	10 to 183	N		0		ND	5	Y		2	Y		0			0		ND	5	Y		1	Y
	Aroclor 1221	0.1 mg/kg	9	SVOC	6 to 183	10 to 183	N		0		ND	5	Y		2	Y		0			0		ND	5	Y		1	Y
	Aroclor 1232	0.5 mg/kg	9	SVOC	6 to 183	10 to 183	N		0		ND	5	Y		2	Y		0			0		ND	5	Y		1	Y
	Aroclor 1242	0.5 mg/kg	9	SVOC	6 to 183	10 to 183	N		0		ND	5	Y		2	Y		0			0		ND	5	Y		1	Y
	Aroclor 1248	0.5 mg/kg	9	SVOC	6 to 183	10 to 183	N		0		ND	3	Y		2	Y		0			0		ND	5	Y		1	Y
	Aroclor 1254	0.5 mg/kg	9	SVOC	6 to 183	10 to 183	N	101 to 101	1	Y	ND	3	Y		2	Y		0		100 to 100	1	Y	ND	3	Y		1	Y
	Aroclor 1260	0.5 mg/kg	9	SVOC	6 to 183	10 to 183	N	98 to 106	2	Y	ND	3	Y		2	Y		0		111 to 119	2	Y	ND	3	Y		1	Y
	PCBs (Total)	0.5 mg/kg	9	SVOC	6 to 183	10 to 183	N		0		ND	3	Y		1	Y		0			0		ND	3	Y		1	Y
Polycyclic Aromatic Hydrocarbons	Acenaphthene	0.5 mg/kg	20	SVOC	6 to 183	-21 to 11	N	90 to 100	2	Y	ND	3	Y		3	Y		0		94 to 99	2	Y	ND	3	Y		1	Y
	Acenaphthylene	0.5 mg/kg	20	SVOC	6 to 183	-21 to 11	N	94 to 101	2	Y	ND	3	Y		3	Y		0		102 to 103	2	Y	ND	3	Y		1	Y
	Anthracene	0.5 mg/kg	20	SVOC	6 to 183	-21 to 11	N	98 to 102	2	Y	ND	3	Y		3	Y		0		97 to 103	2	Y	ND	3	Y		1	Y
	Benz(a)anthracene	0.5 mg/kg	20	SVOC	6 to 183	-21 to 11	N	88 to 100	2	Y	ND	1	Y	18	3	Y		0		99 to 107	2	Y		0			1	Y
	Benzo(a)pyrene	0.5 mg/kg	20	SVOC	6 to 183	-21 to 11	N	83 to 102	3	Y	ND	3	Y	18	3	Y		0		83 to 108	3	Y	ND	3	Y		1	Y
	Benzo(a)pyrene TEQ (lower bound[c])	0.5 mg/kg	20	SVOC	3 to 183	-21 to 11	N		0		ND	3	Y		1	Y		0			0		ND	3	Y		1	Y
	Benzo(a)pyrene TEQ (medium bound[c])	0.5 mg/kg	20	SVOC	3 to 183	-21 to 11	N		0		ND	3	Y		1	Y		0			0		ND	3	Y	0	1	Y
	Benzo(a)pyrene TEQ (upper bound[c])	0.5 mg/kg	20	SVOC	3 to 183	-21 to 11	N		0		ND	1	Y		1	Y		0			0			0		0	1	Y
	Benzo(b,j)fluoranthene	0.5 mg/kg	20	SVOC	6 to 10	10 to 11	N	92 to 104	2	Y	ND	3	Y	33	2	Y		0		102 to 110	2	Y	ND	3	Y		1	Y
	Benzo(g,h,i)perylene	0.5 mg/kg	20	SVOC	6 to 183	-21 to 11	N	90 to 97	2	Y	ND	3	Y		3	Y		0		105 to 111	2	Y	ND	3	Y		1	Y
	Benzo(k)fluoranthene	0.5 mg/kg	20	SVOC	6 to 10	10 to 11	N	106 to 106	2	Y	ND	3	Y		2	Y		0		99 to 105	2	Y	ND	3	Y		1	Y
	Chrysene	0.5 mg/kg	20	SVOC	6 to 183	-21 to 11	N	99 to 116	3	Y	ND	3	Y	18	3	Y		0		98 to 115	3	Y	ND	3	Y		1	Y
	Dibenz(a,h)anthracene	0.5 mg/kg	20	SVOC	6 to 183	-21 to 11	N	87 to 91	2	Y	ND	3	Y		3	Y		0		100 to 104	2	Y	ND	3	Y		1	Y
	Fluoranthene	0.5 mg/kg	20	SVOC	6 to 183	-21 to 11	N	102 to 112	3	Y	ND	2	Y	40	3	Y		0		111 to 114	3	Y	ND	3	Y		1	Y
	Fluorene	0.5 mg/kg	20	SVOC	6 to 183	-21 to 11	N	100 to 104	3	Y	ND	3	Y		3	Y		0		103 to 109	3	Y	ND	3	Y		1	Y
	Indeno(1,2,3-c,d)pyrene	0.5 mg/kg	20	SVOC	6 to 183	-21 to 11	N	93 to 93	2	Y	ND	3	Y		3	Y		0		105 to 115	2	Y	ND	3	Y		1	Y
	Naphthalene	0.5 mg/kg	40	VOC	6 to 183	-21 to 183	N	89 to 112	5	Y	ND	1	Y		4	Y		0		96 to 113	5	Y		0			2	Y
	PAHs (Total)	0.5 mg/kg	20	SVOC	3 to 4	10 to 11	Y		0		ND	1	Y		0	N		0			0			0			1	Y
	Phenanthrene	0.5 mg/kg	20	SVOC	6 to 183	-21 to 11	N	100 to 107	3	Y	ND	2	Y	18	3	Y		0		98 to 112	3	Y	ND	3	Y		1	Y
	Pyrene	0.5 mg/kg	20	SVOC	6 to 183	-21 to 11	N	102 to 111	3	Y	ND	3	Y	32	3	Y		0		109 to 112	3	Y	ND	3	Y		1	Y
	Total Positive PAHs		0	SVOC	183	-21	N		0		ND	3	Y		1	Y		0			0		ND	3	Y		0	N
Solvents	2-Propanone (Acetone)	0.5 mg/kg	15	Other	6 to 10	10 to 11	Y	75 to 89	2	Y	ND	3	Y		0	N		0		103 to 127	2	Y	ND	3	Y		2	Y
Surrogate	4-Terphenyl-d14		0	SVOC			Y	112 to 112	1	Y	ND	3	Y		0	N	67 to 134	25	N		0		ND	3	Y		0	N
	Fluorobenzene (surr.)		0	SVOC			Y		0		ND	3	Y		0	N	59 to 108	17	N		0		ND	3	Y		0	N
	Surrogate 2-fluorobiphenyl		0	SVOC			Y		0		ND	3	Y		0	N	89 to 146	19	N		0		ND	3	Y		0	N
	Surrogate 4-BFB		0	VOC			Y	103 to 103	1	Y	ND	3	Y		0	N	63 to 149	31	N		0		ND	3	Y		0	N
	Surrogate aaa-Trifluorotoluene		0	SVOC			Y	97 to 97	2	Y	ND	3	Y		0	N	97 to 100	10	Y		0		ND	3	Y		0	N
	Surrogate Dibromofluoromethane		0	VOC			Y	109 to 109	1	Y	ND	1	Y		0	N	109 to 114	5	Y		0			0			0	N
	Surrogate Dibutylchlorendate		0	SVOC			Y		0		ND	1	Y		0	N	70 to 134	10	N		0			0			0	N
	Surrogate o-Terphenyl		0	SVOC			Y	88 to 88	1	Y	ND	3	Y		0	N	88 to 100	5	Y		0		ND	3	Y		0	N
	Surrogate TCMX		0	SVOC			Y	86 to 110	2	Y	ND	3	Y		0	N	81 to 118	20	Y		0		ND	3	Y		0	N
	Surrogate toluene-d8		0	VOC			Y	98 to 98	1	Y	ND	3	Y		0	N	96 to 98	5	Y		0		ND	3	Y		0	N
TPHs (NEPC 1999)	C10-C14 Fraction	20 mg/kg	20	SVOC	6 to 183	-23 to 11	N	98 to 114	3	Y	ND	3	Y		3	Y		0		102 to 113	3	Y	ND	3	Y		1	Y
	C10-C36 Fraction (Total)	50 mg/kg	20	SVOC	3 to 4	10 to 11	Y		0		ND	2	Y		0	N		0			0		ND	3	Y		1	Y
	C15-C28 Fraction	50 mg/kg	20	SVOC	6 to 183	-23 to 11	N	100 to 100	1	Y	ND	1	Y	25	3	Y		0		100 to 100	1	Y	ND	1	Y		1	Y
	C29-C36 Fraction	50 mg/kg	20	SVOC	6 to 183	-23 to 11	N	91 to 91	1	Y	ND	5	Y	38	3	Y		0		83 to 83	1	Y	ND	3	Y		1	Y
	C6-C9 Fraction	20 mg/kg	20	VOC	6 to 183	10 to 183	N	76 to 103	3	Y	ND	5	Y		2	Y		0		89 to 98	3	Y	ND	3	Y		1	Y
TRHs (NEPC 2013)	>C10-C16 Fraction	50 mg/kg	20	SVOC	6 to 183	-23 to 11	N	106 to 120	3	Y	ND	5	Y		3	Y		0		107 to 121	3	Y	ND to 0.001 mg/l	3	N		1	Y
	>C10-C16 less Naphthalene (F2)	50 mg/kg	20	SVOC	3 to 183	-23 to 11	N		0		ND	5	Y		1	Y		0			0		ND to 0.001 mg/l	3	N		1	Y
	>C10-C40 Fraction (Total)		0	SVOC	183	-23	N		0		ND	5	Y		1	Y		0			0		ND	3	Y		0	N
	>C16-C34 Fraction	100 mg/kg	20	SVOC	6 to 183	-23 to 11	N	100 to 100	1	Y	ND	5	Y	24	3	Y		0		100 to 100	1	Y	ND	3	Y		1	Y
	>C34-C40 Fraction	100 mg/kg	20	SVOC	6 to 183	-23 to 11	N	91 to 91	1	Y	ND	5	Y		3	Y		0		83 to 83	1	Y	ND	3	Y		1	Y
	C6-C10 Fraction	20 mg/kg	20	VOC	6 to 183	10 to 183	N	72 to 103	3	Y	ND	5	Y		2	Y		0		85 to 98	3	Y	ND	3	Y		1	Y
	C6-C10 less BTEX (F1)	20 mg/kg	20	VOC	3 to 183	10 to 183	N		0		ND	3	Y		1	Y		0			0		ND	3	Y		1	Y
Trihalomethanes	Bromodichloromethane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	112 to 123	3	Y	ND	2	Y		3	Y		0		116 to 127	3	Y	ND	3	Y		2	Y
	Chloroform	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	92 to 129	3	Y	ND	2	Y		3	Y		0		103 to 128	3	Y	ND	3	Y		2	Y
	Dibromochloromethane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	105 to 129	3	Y	ND	3	Y		3	Y		0		112 to 131	3	N	ND	3	Y		2	Y
	Tribromomethane	0.5 mg/kg	15	VOC	6 to 183	10 to 183	N	84 to 124	2	Y	ND	1	Y		3	Y		0		112 to 112	2	Y		0			2	Y
BTEX	Benzene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	86 to 111	4	Y	ND	3	Y		0	N		0		100 to 122	5	Y	ND	3	Y		0	N
	Ethylbenzene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	86 to 106	4	Y	ND	2	Y		0	N		0		92 to 107	5	Y	ND	3	Y		1	Y
	Toluene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	86 to 103	4	Y	ND	1	Y		0	N		0		92 to 115	5	Y		0		1	1	Y
	Xylene (m & p)	0.002 mg/L	3	VOC	3 to 4	4 to 11	Y	87 to 104	4	Y	ND	3	Y		0	N		0		88 to 120	5	Y	ND	3	Y		0	N
	Xylene (o)	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	87 to 99	4	Y	ND	3	Y		0	N		0		85 to 116	5	Y	ND	3	Y		0	N
	Xylene (Total)	0.003 mg/L	3	VOC	3 to 4	10 to 11	Y	92 to 102	3	Y	ND	1	Y		0	N		0		87 to 118	5	Y		0			0	N
Chlorinated Alkanes	1,1,1,2-tetrachloroethane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	98 to 106	2	Y	ND	3	Y		1	Y		0		106 to 106	1	Y	ND	3	Y		1	Y
	1,1,1-trichloroethane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	83 to 103	3	Y	ND	3	Y		1	Y		0		115 to 115	1	Y	ND	3	Y		1	Y
	1,1,2,2-tetrachloroethane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	90 to 96	2	Y	ND	1	Y		1	Y		0		96 to 96	1	Y		0			1	Y
	1,1,2-trichloroethane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	95 to 101	2	Y	ND	1	Y		1	Y		0		103 to 103	1	Y		0			1	Y
	1,1-dichloroethane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	88 to 121	3	Y	ND	1	Y		1	Y		0		95 to 95	1	Y		0			1	Y
	1,2,3-trichloropropane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	93 to 114	2	Y	ND	3	Y		1	Y		0		102 to 102	1	Y	ND	3	Y		1	Y
	1,2-dibromo-3-chloropropane		0	VOC	4	4	Y		0		ND	1	Y		0	N		0			0			0			0	N
	1,2-dichloroethane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	86 to 99	3	Y	ND	2	Y		1	Y		0		105 to 105	1	Y	ND	3	Y		1	Y
	1,2-dichloropropane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	88 to 100	2	Y	ND	2	Y		1	Y		0		96 to 96	1	Y	ND	3	Y		1	Y
	1,3-dichloropropane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	91 to 101	2	Y	ND	2	Y		1	Y		0		102 to 102	1	Y	ND	3	Y		1	Y
	2,2-dichloropropane		0	VOC	4	4	Y		0		ND	2	Y		0	N		0			0		ND	3	Y		0	N
	Bromochloromethane	0.001 mg/L	3	Other	3 to 4	4 to 11	Y	90 to 94	2	Y	ND	2	Y		1	Y		0		95 to 95	1	Y	ND	3	Y		1	Y
	Carbon tetrachloride	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	100 to 115	2	Y	ND	2	Y		1	Y		0		116 to 116	1	Y	ND	3	Y		1	Y
	Chloroethane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	85 to 92	2	Y	ND	2	Y		1	Y		0		100 to 100	1	Y	ND	3	Y		1	Y
	Chloromethane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	77 to 89	2	Y	ND	2	Y		1	Y		0		75 to 75	1	Y	ND	3	Y		1	Y
	Dichlorodifluoromethane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	70 to 105	2	N	ND	2	Y		1	Y		0		104 to 104	1	Y	ND	3	Y		1	Y
	Dichloromethane	0.001 mg/L	3	SVOC	3 to 4	10 to 11	Y	97 to 116	2	Y	ND	2	Y		1	Y		0		93 to 93	1	Y	ND	3	Y		1	Y
	Trichlorofluoromethane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	84 to 112	2	Y	ND	2	Y		1	Y		0		110 to 110	1	Y	ND	3	Y		1	Y
Chlorinated Alkenes	1,1-dichloroethene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	101 to 122	2	Y	ND	2	Y		1	Y		0		98 to 98	1	Y	ND	3	Y		1	Y
	1,1-dichloropropene		0	VOC	4	4	Y		0		ND	2	Y		0	N		0			0		ND	3	Y		0	N
	2-chlorotoluene		0	VOC	4	4	Y		0		ND	2	Y		0	N		0			0		ND	3	Y		0	N
	3-chloropropene	0.001 mg/L	3	SVOC	3 to 4	10 to 11	Y	96 to 126	2	Y	ND	2	Y		1	Y		0		84 to 84	1	Y	ND	3	Y		1	Y
	4-chlorotoluene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	97 to 100	2	Y	ND	2	Y		1	Y		0		100 to 100	1	Y	ND	3	Y		1	Y
	cis-1,2-dichloroethene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	94 to 102	2	Y	ND	2	Y		1	Y		0		99 to 99	1	Y	ND	3	Y		1	Y
	cis-1,3-dichloropropene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	92 to 96	2	Y	ND	2	Y		1	Y		0		103 to 103	1	Y	ND	3	Y		1	Y
	Tetrachloroethene	0.001 mg/L	3	SVOC	3 to 4	4 to 11	Y	92 to 111	3	Y	ND	2	Y		1	Y		0		110 to 110	1	Y	ND	3	Y	15	1	Y
	trans-1,2-dichloroethene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	96 to 122	2	Y	ND	2	Y		0	N		0		95 to 95	1	Y	ND	3	Y		1	Y
	trans-1,3-dichloropropene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	93 to 93	2	Y	ND	1	Y		1	Y		0		100 to 100	1	Y	ND	1	Y		1	Y
	Trichloroethene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	82 to 100	3	Y	ND	2	Y		1	Y		0		107 to 107	1	Y	ND	3	Y		1	Y
	Vinyl Chloride	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	82 to 105	2	Y	ND	1	Y		0	N		0		100 to 100	1	Y		0			1	Y

Filter: ALL

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Chlorinated Benzenes	1,2,3-trichlorobenzene		0	VOC	4	4	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
	1,2,4-trichlorobenzene		0	VOC	4	4	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
	1,2-Dichlorobenzene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	97 to 98	2	Y	ND	1	Y		1	Y		0		100 to 100	1	Y	ND	1	Y		1	Y
	1,3-dichlorobenzene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	99 to 100	2	Y	ND	1	Y		1	Y		0		102 to 102	1	Y	ND	1	Y		1	Y
	1,4-dichlorobenzene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	99 to 99	2	Y	ND	1	Y		1	Y		0		101 to 101	1	Y	ND	1	Y		1	Y
	Chlorobenzene	0.001 mg/L	3	Other	3 to 4	4 to 11	Y	97 to 97	2	Y	ND	1	Y		1	Y		0		102 to 102	1	Y	ND	1	Y		1	Y
	Hexachlorobenzene		0	SVOC	3 to 5	10 to 11	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
Herbicides & Fungicides	Dinoseb		0	SVOC	5	10	Y		0		ND	1	Y		0	**N**		0			0		ND	1	Y		0	**N**
Metals & Metalloids	Arsenic (Total)	0.001 mg/L	3	Other	3 to 4	4 to 11	Y	85 to 101	4	Y	ND	1	Y		0	**N**		0		80 to 90	3	Y	ND	1	Y	0	1	Y
	Cadmium	0.0002 mg/L	3	Other	3 to 4	4 to 11	Y	86 to 104	4	Y	ND	1	Y		1	Y		0		80 to 94	3	Y	ND	1	Y		1	Y
	Chromium (Total)	0.001 mg/L	3	Other	3 to 4	4 to 11	Y	78 to 101	4	Y	ND	1	Y		0	**N**		0		74 to 79	3	Y	ND	1	Y	0	1	Y
	Copper	0.001 mg/L	3	Other	3 to 4	4 to 11	Y	79 to 100	4	Y	ND	1	Y		1	Y		0		71 to 77	3	Y	ND	1	Y		1	Y
	Lead	0.001 mg/L	3	Other	3 to 4	4 to 11	Y	81 to 104	4	Y	ND	1	Y		1	Y		0		73 to 92	3	Y	ND	1	Y		1	Y
	Mercury (Inorganic)	0.0001 mg/L	3	Other	3 to 4	4 to 11	Y	96 to 121	4	Y	0.001 to 0.001 mg/	1	**N**		1	Y		0		80 to 111	3	Y	0.003 to 0.003 mg/l	1	**N**	67	1	**N**
	Nickel	0.001 mg/L	3	Other	3 to 4	4 to 11	Y	77 to 102	4	Y	ND	1	Y		0	**N**		0		72 to 75	3	Y	ND	1	Y	0	1	Y
	Zinc	0.005 mg/L	3	Other	3 to 4	4 to 11	Y	81 to 102	4	Y		0			0	**N**		0		71 to 75	3	Y	ND	1	Y		1	Y
Miscellaneous Hydrocarbons	1,2-dibromoethane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	96 to 100	2	Y		0			1	Y		0		104 to 104	1	Y	ND	1	Y		1	Y
	2-Butanone (MEK)	0.001 mg/L	3	VOC	3 to 4	10 to 11	Y	97 to 106	2	Y	ND	1	Y		1	Y		0		101 to 101	1	Y	ND	1	Y		1	Y
	4-Methyl-2-pentanone (MIBK)	0.001 mg/L	3	VOC	3 to 4	10 to 11	Y	91 to 96	2	Y	ND	1	Y		1	Y		0		104 to 104	1	Y	ND	3	Y		1	Y
	Bromomethane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	91 to 101	2	Y	ND	1	Y		1	Y		0		92 to 92	1	Y	ND	3	Y		1	Y
	Cyclohexane		0	VOC	4	4	Y		0		ND	1	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Dibromomethane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	95 to 100	2	Y	ND	1	Y		1	Y		0		105 to 105	1	Y	ND	3	Y		1	Y
	Iodomethane	0.001 mg/L	3	VOC	3 to 4	10 to 11	Y	118 to 118	2	Y	ND	1	Y		1	Y		0		121 to 121	1	Y	ND	3	Y		1	Y
Miscellaneous Industrial Chemicals	Hexachlorobutadiene		0	VOC	4	4	Y		0		ND	1	Y		0	**N**		0			0		ND	3	Y		0	**N**
Monocyclic Aromatic Hydrocarbons	1,2,4-trimethyl benzene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	97 to 107	2	Y	ND	1	Y		1	Y		0		98 to 98	1	Y	ND	3	Y		1	Y
	1,3,5-trimethyl benzene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	97 to 106	2	Y	ND	1	Y		1	Y		0		97 to 97	1	Y	ND	3	Y		1	Y
	4-isopropyl toluene		0	VOC	4	4	Y		0		ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Bromobenzene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	90 to 105	2	Y	ND	3	Y		1	Y		0		93 to 93	1	Y	ND	3	Y		1	Y
	Isopropylbenzene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	94 to 99	2	Y	ND	3	Y		1	Y		0		100 to 100	1	Y	ND	3	Y		1	Y
	n-butyl benzene		0	VOC	4	4	Y		0		ND to 0.001 mg/l	3	**N**		0	**N**		0			0		ND	3	Y		0	**N**
	n-propyl benzene		0	VOC	4	4	Y		0		ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	sec-butyl benzene		0	VOC	4	4	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Styrene	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	93 to 94	2	Y	ND to 0.001 mg/l	2	**N**		1	Y		0		98 to 98	1	Y	ND	3	Y		1	Y
	Tert-butyl benzene		0	VOC	4	4	Y		0		ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
Organic Sulfur Compounds	Carbon disulfide	0.001 mg/L	3	VOC	3 to 4	10 to 11	Y	100 to 128	2	Y	ND	2	Y		1	Y		0		93 to 93	1	Y	ND	3	Y		1	Y
Organochlorine Pesticides	4,4-DDE		0	SVOC	3 to 5	10 to 11	Y	120 to 120	1	Y	ND to 0.001 mg/l	3	**N**		0	**N**		0			0		ND	3	Y		0	**N**
	Aldrin		0	SVOC	3 to 5	10 to 11	Y	120 to 120	1	Y	ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	alpha-BHC		0	SVOC	3 to 5	10 to 11	Y	110 to 110	1	Y	ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	beta-BHC		0	SVOC	3 to 5	10 to 11	Y	120 to 120	1	Y	ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Chlordane		0	SVOC	3 to 5	10 to 11	Y	120 to 120	1	Y	ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	DDD		0	SVOC	3 to 5	10 to 11	Y	120 to 120	1	Y	ND	6	Y		0	**N**		0			0		ND	6	Y		0	**N**
	DDT		0	SVOC	3 to 5	10 to 11	Y	125 to 125	1	Y		0			0	**N**		0			0		ND	3	Y		0	**N**
	delta-BHC		0	SVOC	3 to 5	10 to 11	Y	130 to 130	1	**N**	ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Dieldrin		0	SVOC	3 to 5	10 to 11	Y	130 to 130	1	**N**	ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Endosulfan alpha		0	SVOC	3 to 5	10 to 11	Y	125 to 125	1	Y		0			0	**N**		0			0			0			0	**N**
	Endosulfan beta		0	SVOC	3 to 5	10 to 11	Y	120 to 120	1	Y	ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Endosulfan sulphate		0	SVOC	3 to 5	10 to 11	Y	125 to 125	1	Y		0			0	**N**		0			0			0			0	**N**
	Endrin		0	SVOC	3 to 5	10 to 11	Y	120 to 120	1	Y		0			0	**N**		0			0			0			0	**N**
	Endrin aldehyde		0	SVOC	3 to 5	10 to 11	Y	115 to 115	1	Y		0			0	**N**		0			0			0			0	**N**
	Endrin ketone		0	SVOC	3 to 5	10 to 11	Y	125 to 125	1	Y		0			0	**N**		0			0			0			0	**N**
	Heptachlor		0	SVOC	3 to 5	10 to 11	Y	110 to 110	1	Y		0			0	**N**		0			0			0			0	**N**
	Heptachlor Epoxide		0	SVOC	3 to 5	10 to 11	Y	80 to 80	1	Y		0			0	**N**		0			0			0			0	**N**
	Lindane		0	SVOC	3 to 5	10 to 11	Y	120 to 120	1	Y		0			0	**N**		0			0			0			0	**N**
	Methoxychlor		0	SVOC	3 to 5	10 to 11	Y	120 to 120	1	Y		0			0	**N**		0			0			0			0	**N**
	Pentachlorophenol		0	SVOC	5	10	Y		0			0			0	**N**		0			0			0			0	**N**
	Toxaphene		0	SVOC	3 to 5	10 to 11	Y		0			0			0	**N**		0			0			0			0	**N**
PAHs in Soil	Benzo(b,j+k)fluoranthene		0	Other	4	5	Y		0		ND	3	Y		0	**N**		0			0		ND to 0.05 mg/l	3	**N**		0	**N**
Phenols	2,4,5-trichlorophenol		0	SVOC	5	10	Y	107 to 107	1	Y		0			0	**N**		0			0		ND	3	Y		0	**N**
	2,4,6-trichlorophenol		0	SVOC	5	10	Y	114 to 114	1	Y	ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	2,4-dichlorophenol		0	SVOC	5	10	Y	96 to 96	1	Y	ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	2,4-dimethylphenol		0	SVOC	5	10	Y	80 to 80	1	Y	ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	2,4-dinitrophenol		0	SVOC	5	10	Y	113 to 113	1	Y	ND	3	Y		0	**N**		0			0		ND to 0.05 mg/l	3	**N**		0	**N**
	2,6-dichlorophenol		0	SVOC	5	10	Y	82 to 82	1	Y		0			0	**N**		0			0		ND to 0.05 mg/l	3	**N**		0	**N**
	2-chlorophenol		0	SVOC	5	10	Y	71 to 71	1	Y	ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	2-Methylphenol		0	SVOC	5	10	Y	61 to 61	1	**N**	ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	2-nitrophenol		0	SVOC	5	10	Y	102 to 102	1	Y	ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	3- & 4-Methylphenol		0	SVOC	5	10	Y	54 to 54	1	**N**		0			0	**N**		0			0		ND	3	Y		0	**N**
	4,6-Dinitro-2-methylphenol		0	SVOC	5	10	Y	119 to 119	1	Y	ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	4,6-Dinitro-o-cyclohexyl phenol		0	SVOC	5	10	Y	126 to 126	1	Y	ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	4-Chloro-3-Methylphenol		0	SVOC	5	10	Y	84 to 84	1	Y	ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	4-nitrophenol		0	SVOC	5	10	Y	84 to 84	1	Y	ND	3	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Phenol		0	SVOC	5	10	Y		0						0	**N**		0			0						0	**N**
	Total Halogenated Phenol		0	SVOC	3	10	Y		0						0	**N**		0			0						0	**N**
	Total Non-Halogenated Phenol		0	SVOC	3	10	Y		0						0	**N**		0			0						0	**N**
	Total Tetrachlorophenols		0	SVOC	5	10	Y	114 to 114	1	Y					0	**N**		0			0						0	**N**
Polychlorinated Biphenyls	Aroclor 1016		0	SVOC	3 to 5	10 to 11	Y		0						0	**N**		0			0						0	**N**
	Aroclor 1221		0	SVOC	3 to 5	10 to 11	Y		0						0	**N**		0			0						0	**N**
	Aroclor 1232		0	SVOC	3 to 5	10 to 11	Y		0						0	**N**		0			0						0	**N**
	Aroclor 1242		0	SVOC	3 to 5	10 to 11	Y		0						0	**N**		0			0						0	**N**
	Aroclor 1248		0	SVOC	3 to 5	10 to 11	Y		0						0	**N**		0			0						0	**N**
	Aroclor 1254		0	SVOC	3 to 5	10 to 11	Y		0						0	**N**		0			0						0	**N**
	Aroclor 1260		0	SVOC	3 to 5	10 to 11	Y	117 to 117	1	Y					0	**N**		0			0						0	**N**
	PCBs (Total)		0	SVOC	3 to 5	10 to 11	Y		0						0	**N**		0			0						0	**N**
Polycyclic Aromatic Hydrocarbons	Acenaphthene	0.00005 mg/L	3	SVOC	3 to 5	5 to 11	Y	86 to 91	2	Y					0	**N**		0		107 to 107	1	Y					1	Y
	Acenaphthylene	0.00005 mg/L	3	SVOC	3 to 5	5 to 11	Y	91 to 93	2	Y					0	**N**		0		103 to 103	1	Y					1	Y
	Anthracene	0.00005 mg/L	3	SVOC	3 to 5	5 to 11	Y	91 to 117	2	Y					0	**N**		0		113 to 113	1	Y					1	Y
	Benz(a)anthracene	0.00005 mg/L	3	SVOC	3 to 5	5 to 11	Y	89 to 127	2	Y					0	**N**		0		99 to 99	1	Y					1	Y
	Benzo(a)pyrene	0.00001 mg/L	3	SVOC	3 to 5	5 to 11	Y	86 to 109	3	Y					0	**N**		0		104 to 104	1	Y				0	1	Y
	Benzo(a)pyrene TEQ (WHO)		0	SVOC	4	5	Y		0						0	**N**		0			0						0	**N**
	Benzo(b,j)fluoranthene	0.00005 mg/L	3	SVOC	3 to 5	10 to 11	Y	97 to 99	2	Y					0	**N**		0		100 to 100	1	Y					1	Y
	Benzo(g,h,i)perylene	0.00005 mg/L	3	SVOC	3 to 5	5 to 11	Y	86 to 108	2	Y					0	**N**		0		113 to 113	1	Y					1	Y
	Benzo(k)fluoranthene	0.00005 mg/L	3	SVOC	3 to 5	10 to 11	Y	95 to 118	2	Y					0	**N**		0		115 to 115	1	Y					1	Y
	Chrysene	0.00005 mg/L	3	SVOC	3 to 5	5 to 11	Y	98 to 114	3	Y					0	**N**		0		115 to 115	1	Y					1	Y
	Dibenz(a,h)anthracene	0.00005 mg/L	3	SVOC	3 to 5	5 to 11	Y	81 to 123	2	Y					0	**N**		0		104 to 104	1	Y					1	Y
	Fluoranthene	0.00005 mg/L	3	SVOC	3 to 5	5 to 11	Y	92 to 117	3	Y					0	**N**		0		112 to 112	1	Y					1	Y

Filter: ALL

	Fluorene	0.00005 mg/L	3	SVOC	3 to 5	5 to 11	Y	81 to 101	3	Y					0	N		0		104 to 104	1	Y					1	Y
	Indeno(1,2,3-c,d)pyrene	0.00005 mg/L	3	SVOC	3 to 5	5 to 11	Y	105 to 125	2	Y					0	N		0		109 to 109	1	Y					1	Y
	Naphthalene	0.00005 to 0.01 mg/L	6	VOC	3 to 5	4 to 11	Y	75 to 115	5	Y					0	N		0		88 to 108	4	Y				35	2	Y
	PAHs (Total)	0.00005 mg/L	3	SVOC	3 to 4	10 to 11	Y		0						0	N		0			0					17	1	Y
	Phenanthrene	0.00005 mg/L	3	SVOC	3 to 5	5 to 11	Y	92 to 110	3	Y					0	N		0		114 to 114	1	Y				46	1	Y
	Pyrene	0.00005 mg/L	3	SVOC	3 to 5	5 to 11	Y	89 to 116	3	Y					0	N		0		113 to 113	1	Y					1	Y
	Total Positive PAHs		0	SVOC	4	5	Y		0						0	N		0			0						0	N
Solvents	2-Propanone (Acetone)	1 µg/L	3	Other	3 to 4	10 to 11	Y	87 to 100	2	Y					0	N		0		111 to 111	1	Y				0	1	Y
Surrogate	4-Terphenyl-d14		0	SVOC			Y	96 to 96	1	Y					0	N	0 to 145	10	N		0						0	N
	Fluorobenzene (surr.)		0	SVOC			Y		0						0	N	67 to 107	7	N		0						0	N
	Surrogate 2-fluorobiphenyl		0	SVOC			Y		0						0	N	0 to 81	7	N		0						0	N
	Surrogate 4-BFB		0	VOC			Y	88 to 88	2	Y					0	N	88 to 99	17	Y		0						0	N
	Surrogate Dibromofluoromethane		0	VOC			Y	108 to 108	2	Y					0	N	108 to 110	6	Y		0						0	N
	Surrogate Dibutylchlorendate		0	SVOC			Y		0						0	N	75 to 109	3	Y		0						0	N
	Surrogate o-Terphenyl		0	SVOC			Y	112 to 112	1	Y					0	N	80 to 112	3	Y		0						0	N
	Surrogate Phenol-d6		0	SVOC			Y		0						0	N		1	N		0						0	N
	Surrogate TCMX		0	SVOC			Y		0						0	N	62 to 62	1	N		0						0	N
	Surrogate toluene-d8		0	VOC			Y	103 to 103	2	Y					0	N	101 to 103	6	Y		0						0	N
TPHs (NEPC 1999)	C10-C14 Fraction	0.05 mg/L	3	SVOC	3 to 5	4 to 11	Y	94 to 119	3	Y					0	N		0		72 to 72	1	Y					1	Y
	C10-C36 Fraction (Total)	0.1 mg/L	3	SVOC	3 to 4	10 to 11	Y		0						0	N		0			0					100	1	N
	C15-C28 Fraction	0.1 mg/L	3	SVOC	3 to 5	4 to 11	Y	118 to 118	1	Y					0	N		0			0					93	1	N
	C29-C36 Fraction	0.1 mg/L	3	SVOC	3 to 5	4 to 11	Y	111 to 111	1	Y					0	N		0			0					0	1	Y
	C6-C9 Fraction	0.02 mg/L	3	VOC	3 to 4	4 to 11	Y	86 to 127	3	Y				0	2	Y		0		104 to 115	2	Y				0	1	Y
TRHs (NEPC 2013)	>C10-C16 Fraction	0.05 mg/L	3	SVOC	3 to 5	4 to 11	Y	99 to 119	3	Y					0	N		0		74 to 74	1	Y					1	Y
	>C10-C16 less Naphthalene (F2)	0.05 mg/L	3	SVOC	3 to 4	4 to 11	Y		0						0	N		0			0						1	Y
	>C16-C34 Fraction	0.1 mg/L	3	SVOC	3 to 5	4 to 11	Y	118 to 118	1	Y					0	N		0			0					100	1	N
	>C34-C40 Fraction	0.1 mg/L	3	SVOC	3 to 5	4 to 11	Y	111 to 111	1	Y					0	N		0			0						1	Y
	C6-C10 Fraction	0.02 mg/L	3	VOC	3 to 4	4 to 11	Y	86 to 113	3	Y				0	2	Y		0		101 to 102	2	Y				0	1	Y
	C6-C10 less BTEX (F1)	0.02 mg/L	3	VOC	3 to 4	4 to 11	Y		0						0	N		0			0					0	1	Y
Trihalomethanes	Bromodichloromethane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	90 to 99	3	Y					1	Y		0		105 to 105	1	Y					1	Y
	Chloroform	0.005 mg/L	3	VOC	3 to 4	4 to 11	Y	90 to 104	3	Y					1	Y		0		103 to 103	1	Y					1	Y
	Dibromochloromethane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	96 to 104	3	Y					1	Y		0		110 to 110	1	Y					1	Y
	Tribromomethane	0.001 mg/L	3	VOC	3 to 4	4 to 11	Y	98 to 99	2	Y					1	Y		0		107 to 107	1	Y					1	Y

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Contents

Count of Results

Matrix_Type	Sample_Type	Reg	Leached	Spike_Compounds	Surrogate
GAS	Normal	1052	0	0	60
GAS	Field_D	108	0	0	6
GAS	Field_B	104	0	0	6
GAS	MB	51	0	0	0
GAS	LCS	6	0	0	0
SOIL	Normal	2464	8	0	94
SOIL	MB	370	1	0	9
SOIL	LAB_D	362	1	0	9
SOIL	LCS	264	0	0	9
SOIL	MS	47	0	207	9
SOIL	Field_D	214	0	0	8
SOIL	Interlab_D	158	0	0	9
WATER	Rinsate	377	0	0	17
WATER	MB	358	0	0	8
WATER	Normal	270	0	0	12
WATER	LCS	249	0	0	8
WATER	MS	0	0	114	0
WATER	Interlab_D	99	0	0	8
WATER	Field_D	90	0	0	4
WATER	LAB_D	62	0	0	0
WATER	Trip_S	12	0	0	2
WATER	Trip_B	12	0	0	2

[Filter]

Field Blanks (GAS)
Filter: ALL

SDG	545643	545643
Field ID	MB_FRONT	MB_BACK
Sampled_Date/Time	5/5/2017	5/5/2017
Sample Type	Field_B	Field_B

Chem_Group	ChemName	Units	EQL		
BTEX	Benzene	mg/m3	0.08333335	<0.08333335	<0.08333335
	Ethylbenzene	mg/m3	0.08333335	<0.08333335	<0.08333335
	Toluene	mg/m3	0.08333335	<0.08333335	<0.08333335
	Xylene (Total)	mg/m3	0.25000005	<0.25000005	<0.25000005
Chlorinated Alkanes	1,1,1,2-tetrachloroethane	mg/m3	0.08333335	<0.08333335	<0.08333335
	1,1,1-trichloroethane	mg/m3	0.08333335	<0.08333335	<0.08333335
	1,1,2,2-tetrachloroethane	mg/m3	0.08333335	<0.08333335	<0.08333335
	1,1,2-trichloroethane	mg/m3	0.08333335	<0.08333335	<0.08333335
	1,1-dichloroethane	mg/m3	0.08333335	<0.08333335	<0.08333335
	1,2,3-trichloropropane	mg/m3	0.08333335	<0.08333335	<0.08333335
	1,2-dibromo-3-chloropropane	mg/m3	0.08333335	<0.08333335	<0.08333335
	1,2-dichloroethane	mg/m3	0.08333335	<0.08333335	<0.08333335
	1,2-dichloropropane	mg/m3	0.08333335	<0.08333335	<0.08333335
	1,3-dichloropropane	mg/m3	0.08333335	<0.08333335	<0.08333335
	2,2-dichloropropane	mg/m3	0.08333335	<0.08333335	<0.08333335
	Bromochloromethane	mg/m3	0.08333335	<0.08333335	<0.08333335
	Carbon tetrachloride	mg/m3	0.08333335	<0.08333335	<0.08333335
	Trichlorofluoromethane	mg/m3	0.08333335	<0.08333335	<0.08333335
Chlorinated Alkenes	1,1-dichloroethene	mg/m3	0.08333335	<0.08333335	<0.08333335
	1,1-dichloropropene	mg/m3	0.08333335	<0.08333335	<0.08333335
	2-chlorotoluene	mg/m3	0.08333335	<0.08333335	<0.08333335
	4-chlorotoluene	mg/m3	0.08333335	<0.08333335	<0.08333335
	cis-1,2-dichloroethene	mg/m3	0.08333335	<0.08333335	<0.08333335
	cis-1,3-dichloropropene	mg/m3	0.08333335	<0.08333335	<0.08333335
	Tetrachloroethene	mg/m3	0.08333335	<0.08333335	<0.08333335
	trans-1,3-dichloropropene	mg/m3	0.08333335	<0.08333335	<0.08333335
	Trichloroethene	mg/m3	0.08333335	<0.08333335	<0.08333335
	Vinyl Chloride	mg/m3	0.08333335	<0.08333335	<0.08333335
Chlorinated Benzenes	1,2,3-trichlorobenzene	mg/m3	0.08333335	<0.08333335	<0.08333335
	1,2,4-trichlorobenzene	mg/m3	0.08333335	<0.08333335	<0.08333335
	1,2-Dichlorobenzene	mg/m3	0.08333335	<0.08333335	<0.08333335
	1,3-dichlorobenzene	mg/m3	0.08333335	<0.08333335	<0.08333335
	1,4-dichlorobenzene	mg/m3	0.08333335	<0.08333335	<0.08333335
	Chlorobenzene	mg/m3	0.08333335	<0.08333335	<0.08333335
Miscellaneous Hydrocarbons	1,2-dibromoethane	mg/m3	0.08333335	<0.08333335	<0.08333335
	Dibromomethane	mg/m3	0.08333335	<0.08333335	<0.08333335
Miscellaneous Industrial Chemicals	Hexachlorobutadiene	mg/m3	0.08333335	<0.08333335	<0.08333335
Monocyclic Aromatic Hydrocarbons	1,2,4-trimethyl benzene	mg/m3	0.08333335	<0.08333335	<0.08333335
	1,3,5-trimethyl benzene	mg/m3	0.08333335	<0.08333335	<0.08333335
	4-isopropyl toluene	mg/m3	0.08333335	<0.08333335	<0.08333335
	Isopropylbenzene	mg/m3	0.08333335	<0.08333335	<0.08333335
	n-butyl benzene	mg/m3	0.08333335	<0.08333335	<0.08333335
	n-propyl benzene	mg/m3	0.08333335	<0.08333335	<0.08333335
	sec-butyl benzene	mg/m3	0.08333335	<0.08333335	<0.08333335
	Styrene	mg/m3	0.8333335	<0.8333335	<0.8333335
	Tert-butyl benzene	mg/m3	0.08333335	<0.08333335	<0.08333335
Organic Alcohols	Isopropyl alcohol	mg/m3	1.666667	<1.666667	<1.666667
Polycyclic Aromatic Hydrocarbons	Naphthalene	mg/m3	0.08333335	<0.08333335	<0.08333335
TRHs (NEPC 2013)	>C10-C16 Fraction	mg/m3	1.666667		
	C6-C10 Fraction	mg/m3	1.666667		
Trihalomethanes	Bromodichloromethane	mg/m3	0.08333335	<0.08333335	<0.08333335
	Chloroform	mg/m3	0.08333335	<0.08333335	<0.08333335
	Dibromochloromethane	mg/m3	0.08333335	<0.08333335	<0.08333335
	Tribromomethane	mg/m3	0.08333335	<0.08333335	<0.08333335

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Field Blanks (WATER)
Filter: ALL

SDG	545235	545235	548083	545235	548083
Field ID	RINS 6-5-17	RINS 7-5-17	RINS	TB	TB
Sampled_Date/Time	5/6/2017	5/7/2017	5/26/2017	5/7/2017	5/26/2017
Sample Type	Rinsate	Rinsate	Rinsate	Trip_B	Trip_B

Chem_Group	ChemName	Units	EQL					
BTEX	Benzene	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Ethylbenzene	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Toluene	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Xylene (o)	mg/l	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Xylene (m & p)	mg/l	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
	Xylene (Total)	mg/l	0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Chlorinated Alkanes	1,1,1,2-tetrachloroethane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,1,1-trichloroethane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,1,2,2-tetrachloroethane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,1,2-trichloroethane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,1-dichloroethane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,2,3-trichloropropane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,2-dibromo-3-chloropropane	mg/l	0.001					
	1,2-dichloroethane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,2-dichloropropane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,3-dichloropropane	mg/l	0.001	<0.001	<0.001	<0.001		
	2,2-dichloropropane	mg/l	0.001					
	Bromochloromethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Carbon tetrachloride	mg/l	0.001	<0.001	<0.001	<0.001		
	Chloroethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Chloromethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Dichlorodifluoromethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Dichloromethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Trichlorofluoromethane	mg/l	0.001	<0.001	<0.001	<0.001		
Chlorinated Alkenes	1,1-dichloroethene	mg/l	0.001	<0.001	<0.001	<0.001		
	1,1-dichloropropene	mg/l	0.001					
	2-chlorotoluene	mg/l	0.001					
	3-chloropropene	mg/l	0.001	<0.001	<0.001	<0.001		
	4-chlorotoluene	mg/l	0.001	<0.001	<0.001	<0.001		
	cis-1,2-dichloroethene	mg/l	0.001	<0.001	<0.001	<0.001		
	cis-1,3-dichloropropene	mg/l	0.001	<0.001	<0.001	<0.001		
	Tetrachloroethene	mg/l	0.001	<0.001	<0.001	<0.001		
	trans-1,2-dichloroethene	mg/l	0.001	<0.001	<0.001	<0.001		
	trans-1,3-dichloropropene	mg/l	0.001	<0.001	<0.001	<0.001		
	Trichloroethene	mg/l	0.001	<0.001	<0.001	<0.001		
	Vinyl Chloride	mg/l	0.001	<0.001	<0.001	<0.001		
Chlorinated Benzenes	1,2,3-trichlorobenzene	mg/l	0.001					
	1,2,4-trichlorobenzene	mg/l	0.001					
	1,2-Dichlorobenzene	mg/l	0.001	<0.001	<0.001	<0.001		
	1,3-dichlorobenzene	mg/l	0.001	<0.001	<0.001	<0.001		
	1,4-dichlorobenzene	mg/l	0.001	<0.001	<0.001	<0.001		
	Chlorobenzene	mg/l	0.001	<0.001	<0.001	<0.001		
	Hexachlorobenzene	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
Herbicides & Fungicides	Dinoseb	mg/l	0.1			<0.1		
Metals & Metalloids	Arsenic (Total)	mg/l	0.001	<0.001	<0.001	<0.001		
	Arsenic (Total) (Filtered)	mg/l	0.001					
	Cadmium	mg/l	0.0002	<0.0002	<0.0002	<0.0002		
	Cadmium (Filtered)	mg/l	0.0001					
	Chromium (Total)	mg/l	0.001	<0.001	<0.001	**0.001**		
	Chromium (Total) (Filtered)	mg/l	0.001					
	Copper	mg/l	0.001	**0.001**	**0.001**	<0.001		
	Copper (Filtered)	mg/l	0.001					
	Lead	mg/l	0.001	<0.001	<0.001	<0.001		
	Lead (Filtered)	mg/l	0.001					
	Mercury (Inorganic)	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	Mercury (Inorganic) (Filtered)	mg/l	0.00005					
	Nickel	mg/l	0.001	<0.001	<0.001	<0.001		
	Nickel (Filtered)	mg/l	0.001					
	Zinc	mg/l	0.005	<0.005	<0.005	<0.005		
	Zinc (Filtered)	mg/l	0.001					
Miscellaneous Hydrocarbons	1,2-dibromoethane	mg/l	0.001	<0.001	<0.001	<0.001		
	2-Butanone (MEK)	mg/l	0.001	<0.001	<0.001	<0.001		
	4-Methyl-2-pentanone (MIBK)	mg/l	0.001	<0.001	<0.001	<0.001		
	Bromomethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Cyclohexane	mg/l	0.001					
	Dibromomethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Iodomethane	mg/l	0.001	<0.001	<0.001	<0.001		
Miscellaneous Industrial Chemicals	Hexachlorobutadiene	mg/l	0.001					
Monocyclic Aromatic Hydrocarbons	1,2,4-trimethyl benzene	mg/l	0.001	<0.001	<0.001	<0.001		
	1,3,5-trimethyl benzene	mg/l	0.001	<0.001	<0.001	<0.001		
	4-isopropyl toluene	mg/l	0.001					
	Bromobenzene	mg/l	0.001	<0.001	<0.001	<0.001		
	Isopropylbenzene	mg/l	0.001	<0.001	<0.001	<0.001		
	n-butyl benzene	mg/l	0.001					
	n-propyl benzene	mg/l	0.001					
	sec-butyl benzene	mg/l	0.001					
	Styrene	mg/l	0.001	<0.001	<0.001	<0.001		
	Tert-butyl benzene	mg/l	0.001					
Organic Sulfur Compounds	Carbon disulfide	mg/l	0.001	<0.001	<0.001	<0.001		
Organochlorine Pesticides	4,4-DDE	µg/l	0.1	<0.1	<0.1	<0.1		
	Aldrin	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	alpha-BHC	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	beta-BHC	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	Dieldrin	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	DDD	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	DDT	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	Chlordane	mg/l	0.001	<0.001	<0.001	<0.001		
	delta-BHC	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	Endosulfan alpha	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	Endosulfan beta	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	Endosulfan sulphate	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	Endrin	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	Endrin aldehyde	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	Endrin ketone	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	Heptachlor	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	Heptachlor Epoxide	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	Lindane	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	Methoxychlor	mg/l	0.0001	<0.0001	<0.0001	<0.0001		
	Pentachlorophenol	mg/l	0.01			<0.01		
	Toxaphene	mg/l	0.01	<0.01	<0.01	<0.01		
Phenols	2,4,5-trichlorophenol	mg/l	0.001			<0.001		
	2,4,6-trichlorophenol	mg/l	0.01			<0.01		
	2,4-dichlorophenol	mg/l	0.001			<0.001		
	2,4-dimethylphenol	mg/l	0.001			<0.001		
	2,4-dinitrophenol	mg/l	0.001			<0.001		
	2,6-dichlorophenol	mg/l	0.003			<0.003		
	2-chlorophenol	mg/l	0.003			<0.003		
	2-Methylphenol	mg/l	0.003			<0.003		
	2-nitrophenol	mg/l	0.005			<0.005		
	3- & 4-Methylphenol	mg/l	0.006			<0.006		
	4,6-Dinitro-2-methylphenol	mg/l	0.005			<0.005		
	4,6-Dinitro-o-cyclohexyl phenol	mg/l	0.1			<0.1		
	4-Chloro-3-Methylphenol	mg/l	0.01			<0.01		
	4-nitrophenol	mg/l	0.001			**0.003**		
	Phenol	mg/l	0.003			<0.003		
	Total Halogenated Phenol	mg/l	0.01			<0.01		
	Total Non-Halogenated Phenol	mg/l	0.1			<0.1		
	Total Tetrachlorophenols	mg/l	0.03			<0.03		
Polychlorinated Biphenyls	Aroclor 1016	mg/l	0.005	<0.005	<0.005	<0.005		
	Aroclor 1221	mg/l	0.001	<0.001	<0.001	<0.001		
	Aroclor 1232	mg/l	0.005	<0.005	<0.005	<0.005		
	Aroclor 1242	mg/l	0.005	<0.005	<0.005	<0.005		
	Aroclor 1248	mg/l	0.005	<0.005	<0.005	<0.005		
	Aroclor 1254	mg/l	0.005	<0.005	<0.005	<0.005		
	Aroclor 1260	mg/l	0.005	<0.005	<0.005	<0.005		
	PCBs (Total)	mg/l	0.001	<0.001	<0.001	<0.001		
Polycyclic Aromatic Hydrocarbons	Acenaphthene	mg/l	0.00005	<0.001	<0.001	<0.001		
	Acenaphthylene	mg/l	0.00005	<0.001	<0.001	<0.001		

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Field Blanks (WATER)
Filter: ALL

			SDG	545235	545235	548083	545235	548083
			Field ID	RINS 6-5-17	RINS 7-5-17	RINS	TB	TB
			Sampled_Date/Time	5/6/2017	5/7/2017	5/26/2017	5/7/2017	5/26/2017
			Sample Type	Rinsate	Rinsate	Rinsate	Trip_B	Trip_B
	Anthracene	mg/l	0.00005	<0.001	<0.001	<0.001		
	Benz(a)anthracene	mg/l	0.00005	<0.001	<0.001	<0.001		
	Benzo(a)pyrene	mg/l	0.00001	<0.001	<0.001	<0.001		
	Benzo(a)pyrene TEQ (WHO)	mg/l	0.0005					
	Benzo(b,j)fluoranthene	mg/l	0.00005	<0.001	<0.001	<0.001		
	Benzo(g,h,i)perylene	mg/l	0.00005	<0.001	<0.001	<0.001		
	Benzo(k)fluoranthene	mg/l	0.00005	<0.001	<0.001	<0.001		
	Chrysene	mg/l	0.00005	<0.001	<0.001	<0.001		
	Dibenz(a,h)anthracene	mg/l	0.00005	<0.001	<0.001	<0.001		
	Fluoranthene	mg/l	0.00005	<0.001	<0.001	<0.001		
	Fluorene	mg/l	0.00005	<0.001	<0.001	<0.001		
	Indeno(1,2,3-c,d)pyrene	mg/l	0.00005	<0.001	<0.001	<0.001		
	Naphthalene	mg/l	0.00005	<0.01	<0.01	<0.01		
	Phenanthrene	mg/l	0.00005	<0.001	<0.001	<0.001		
	Pyrene	mg/l	0.00005	<0.001	<0.001	<0.001		
	PAHs (Total)	mg/l	0.00005	<0.001	<0.001	<0.001		
	Total Positive PAHs	mg/l						
Solvents	2-Propanone (Acetone)	µg/l	1	<1	<1	<1		
TPHs (NEPC 1999)	C6-C9 Fraction	mg/l	0.01	<0.02	<0.02	<0.02		
	C10-C14 Fraction	mg/l	0.05	**0.05**	<0.05	<0.05		
	C15-C28 Fraction	mg/l	0.1	<0.1	<0.1	<0.1		
	C29-C36 Fraction	mg/l	0.1	<0.1	<0.1	<0.1		
	C10-C36 Fraction (Total)	mg/l	0.1	<0.1	<0.1	<0.1		
TRHs (NEPC 2013)	>C10-C16 Fraction	mg/l	0.05	**0.05**	<0.05	<0.05		
	>C16-C34 Fraction	mg/l	0.1	<0.1	<0.1	<0.1		
	>C34-C40 Fraction	mg/l	0.1	<0.1	<0.1	<0.1		
	>C10-C16 less Naphthalene (F2)	mg/l	0.05	**0.05**	<0.05	<0.05		
	C6-C10 Fraction	mg/l	0.01	<0.02	<0.02	<0.02		
	C6-C10 less BTEX (F1)	mg/l	0.01	<0.02	<0.02	<0.02		
Trihalomethanes	Bromodichloromethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Chloroform	mg/l	0.001	<0.005	<0.005	<0.005		
	Dibromochloromethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Tribromomethane	mg/l	0.001	<0.001	<0.001	<0.001		

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Contents

Detects in Lab Blanks

SDG	Lab_Report_Number	Matrix_Type	SampleCode	Field_ID	Depth	Sampled_Date-Time	Sample_Type	Compound	Prefix	Result	Extraction_Date
548083	548083	WATER	METHODBLANK_10_548083			5/26/2017	MB	4-Nitrophenol		0.001 MG/L	6/5/2017
548083	548083	WATER	METHODBLANK_10_548083			5/26/2017	MB	Benz(a)anthracene		0.001 MG/L	6/5/2017
548083	548083	WATER	METHODBLANK_10_548083			5/26/2017	MB	Benzo(b&j)fluoranthene		0.001 MG/L	6/5/2017
548083	548083	WATER	METHODBLANK_10_548083			5/26/2017	MB	Chrysene		0.001 MG/L	6/5/2017

Field Duplicates (GAS)
Filter: ALL

SDG	545643	545643	
Field ID	SV01_FRONT	QC01_SV_FRONT	**RPD**
Sampled Date/Time	5/5/2017	5/5/2017	

Chem_Gro	ChemNam	Units	EQL			
Organic Al	Isopropyl a	mg/m3	1.666667	<1.6667	<1.6667	0
cohols						
Chlorinated	1,1,1,2-tetr	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,1,1-trichl	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,1,2,2-tetr	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,1,2-trichl	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,1-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,2,3-trichl	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,2-dibrom	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,2-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,2-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,3-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	2,2-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	Bromochlo	mg/m3	0.08333335	<0.0833	<0.0833	0
	Carbon tet	mg/m3	0.08333335	<0.0833	<0.0833	0
	Trichloroflu	mg/m3	0.08333335	<0.0833	<0.0833	0
l Alkanes						
Chlorinated	1,1-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,1-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	2-chlorotol	mg/m3	0.08333335	<0.0833	<0.0833	0
	4-chlorotol	mg/m3	0.08333335	<0.0833	<0.0833	0
	cis-1,2-dich	mg/m3	0.08333335	<0.0833	<0.0833	0
	cis-1,3-dich	mg/m3	0.08333335	<0.0833	<0.0833	0
	Tetrachlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	trans-1,3-d	mg/m3	0.08333335	<0.0833	<0.0833	0
	Trichloroeth	mg/m3	0.08333335	<0.0833	<0.0833	0
	Vinyl Chlor	mg/m3	0.08333335	<0.0833	<0.0833	0
l Alkenes						
Trihalomet	Bromodich	mg/m3	0.08333335	<0.0833	<0.0833	0
	Chloroform	mg/m3	0.08333335	<0.0833	<0.0833	0
	Dibromoch	mg/m3	0.08333335	<0.0833	<0.0833	0
	Tribromom	mg/m3	0.08333335	<0.0833	<0.0833	0
anes						
TRHs (NEP	>C10-C16	mg/m3	1.666667	<1.6667	<1.6667	0
	C6-C10 Fra	mg/m3	1.666667	<1.6667	<1.6667	0
C 2013)						
BTEX	Benzene	mg/m3	0.08333335	<0.0833	<0.0833	0
	Ethylbenze	mg/m3	0.08333335	<0.0833	<0.0833	0
	Toluene	mg/m3	0.08333335	<0.0833	<0.0833	0
	Xylene (To	mg/m3	0.25000005	<0.25	<0.25	0
Polycyclic A	Naphthalen	mg/m3	0.08333335	<0.0833	<0.0833	0
Aromatic Hydrocarbons						
Monocyclic	1,2,4-trime	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,3,5-trime	mg/m3	0.08333335	<0.0833	<0.0833	0
	4-isopropyl	mg/m3	0.08333335	<0.0833	<0.0833	0

Filter: ALL

Field Duplicates (GAS)
Filter: ALL

			SDG	545643	545643	
			Field ID	SV01_FRONT	QC01_SV_FRONT	**RPD**
			Sampled Date/Time	5/5/2017	5/5/2017	
	Isopropylbe	mg/m3	0.08333335	<0.0833	<0.0833	0
	n-butyl ben	mg/m3	0.08333335	<0.0833	<0.0833	0
	n-propyl be	mg/m3	0.08333335	<0.0833	<0.0833	0
	sec-butyl b	mg/m3	0.08333335	<0.0833	<0.0833	0
	Styrene	mg/m3	0.8333335	<0.8333	<0.8333	0
	Tert-butyl b	mg/m3	0.08333335	<0.0833	<0.0833	0
Aromatic Hydrocarbons						
Miscellaneo	1,2-dibrom	mg/m3	0.08333335	<0.0833	<0.0833	0
	Dibromome	mg/m3	0.08333335	<0.0833	<0.0833	0
ous Hydrocarbons						
Chlorinated	1,2,3-trichl	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,2,4-trichl	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,2-Dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,3-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,4-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	Chlorobenz	mg/m3	0.08333335	<0.0833	<0.0833	0
l Benzenes						
Miscellaneo	Hexachlor	mg/m3	0.08333335	<0.0833	<0.0833	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (1-20 x EQL); 30 (2
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Field Duplicates (GAS)
Filter: ALL

SDG	545643	545643	
Field ID	SV01_BACK	QC01_SV_BACK	**RPD**
Sampled Date/Time	5/5/2017	5/5/2017	

Chem_Gro	ChemNam	Units	EQL			
Organic Alc	Isopropyl a	mg/m3	1.666667	<1.6667	<1.6667	0
cohols						
Chlorinated	1,1,1,2-tetr	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,1,1-trichl	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,1,2,2-tetr	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,1,2-trichl	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,1-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,2,3-trichl	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,2-dibrom	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,2-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,2-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,3-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	2,2-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	Bromochlo	mg/m3	0.08333335	<0.0833	<0.0833	0
	Carbon tet	mg/m3	0.08333335	<0.0833	<0.0833	0
	Trichloroflu	mg/m3	0.08333335	<0.0833	<0.0833	0
l Alkanes						
Chlorinated	1,1-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,1-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	2-chlorotol	mg/m3	0.08333335	<0.0833	<0.0833	0
	4-chlorotol	mg/m3	0.08333335	<0.0833	<0.0833	0
	cis-1,2-dich	mg/m3	0.08333335	<0.0833	<0.0833	0
	cis-1,3-dich	mg/m3	0.08333335	<0.0833	<0.0833	0
	Tetrachlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	trans-1,3-d	mg/m3	0.08333335	<0.0833	<0.0833	0
	Trichloroeth	mg/m3	0.08333335	<0.0833	<0.0833	0
	Vinyl Chlor	mg/m3	0.08333335	<0.0833	<0.0833	0
l Alkenes						
Trihalomeths	Bromodich	mg/m3	0.08333335	<0.0833	<0.0833	0
	Chloroform	mg/m3	0.08333335	<0.0833	<0.0833	0
	Dibromoch	mg/m3	0.08333335	<0.0833	<0.0833	0
	Tribromom	mg/m3	0.08333335	<0.0833	<0.0833	0
anes						
TRHs (NEP	>C10-C16	mg/m3	1.666667	<1.6667	<1.6667	0
	C6-C10 Fra	mg/m3	1.666667	<1.6667	<1.6667	0
C 2013)						
BTEX	Benzene	mg/m3	0.08333335	<0.0833	<0.0833	0
	Ethylbenze	mg/m3	0.08333335	<0.0833	<0.0833	0
	Toluene	mg/m3	0.08333335	<0.0833	<0.0833	0
	Xylene (To	mg/m3	0.25000005	<0.25	<0.25	0
Polycyclic A	Naphthaler	mg/m3	0.08333335	<0.0833	<0.0833	0
Aromatic Hydrocarbons						
Monocyclic	1,2,4-trime	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,3,5-trime	mg/m3	0.08333335	<0.0833	<0.0833	0
	4-isopropyl	mg/m3	0.08333335	<0.0833	<0.0833	0

Filter: ALL

Field Duplicates (GAS)
Filter: ALL

			SDG	545643	545643	
			Field ID	SV01_BACK	QC01_SV_BACK	**RPD**
			Sampled Date/Time	5/5/2017	5/5/2017	
	Isopropylbe	mg/m3	0.08333335	<0.0833	<0.0833	0
	n-butyl ben	mg/m3	0.08333335	<0.0833	<0.0833	0
	n-propyl be	mg/m3	0.08333335	<0.0833	<0.0833	0
	sec-butyl b	mg/m3	0.08333335	<0.0833	<0.0833	0
	Styrene	mg/m3	0.8333335	<0.8333	<0.8333	0
	Tert-butyl b	mg/m3	0.08333335	<0.0833	<0.0833	0
Aromatic Hydrocarbons						
Miscellaneo	1,2-dibrom	mg/m3	0.08333335	<0.0833	<0.0833	0
	Dibromome	mg/m3	0.08333335	<0.0833	<0.0833	0
ous Hydrocarbons						
Chlorinated	1,2,3-trichl	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,2,4-trichl	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,2-Dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,3-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	1,4-dichlor	mg/m3	0.08333335	<0.0833	<0.0833	0
	Chlorobenz	mg/m3	0.08333335	<0.0833	<0.0833	0
l Benzenes						
Miscellaneo	Hexachlor	mg/m3	0.08333335	<0.0833	<0.0833	0

*RPDs have only been considered where a concentratior
**High RPDs are in bold (Acceptable RPDs for each EQL 0-30 x EQL); 30 (> 30 x EQL))
***Interlab Duplicates are matched on a per compound b Any methods in the row header relate to th

Filter: ALL

Field Duplicates (SOIL)
Filter: ALL

		SDG	545235	545236		545235	545235		548083	548083		545235	ENVIROLAB 2017-05-11T00:00:00		545235	ENVIROLAB 2017-05-11T00:00:00			
		Field ID	JB18_0.1-0.2	QC20160506_1	**RPD**	JB09_0.15-0.20	QC20160506_2	**RPD**	JHA07_1.3-1.5	QC20170526-1	**RPD**	JB18_0.1-0.2	QA20170506-1	**RPD**	JB09_0.15-0.20	QA20170506-2	**RPD**			
		Sampled Date/Time	5/6/2017	5/6/2017		5/6/2017	5/6/2017		5/26/2017	5/26/2017		5/6/2017	5/6/2017		5/6/2017	5/6/2017				
Chem_Grd	**ChemName**	**Units**	**EQL**																	
Metals & M	Arsenic (Td	mg/kg	2 (Primary): 4 (Interlab)	7.5	8.6	14	10.0	8.1	21	**7.0**	**2.9**	**83**	**7.5**	**4.0**	**61**	10.0	6.0	50		
	Cadmium	mg/kg	0.4	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	0		
	Chromium	mg/kg	5 (Primary): 1 (Interlab)	39.0	50.0	25	46.0	42.0	9	11.0	8.0	32	39.0	38.0	3	**46.0**	**32.0**	**36**		
	Copper	mg/kg	5 (Primary): 1 (Interlab)	6.2	<5.0	21	**28.0**	**16.0**	**55**	**19.0**	**9.8**	**64**	6.2	5.0	21	**28.0**	**15.0**	**60**		
	Lead	mg/kg	5 (Primary): 1 (Interlab)	12.0	12.0	0	15.0	20.0	29	12.0	8.3	36	12.0	8.0	40	15.0	14.0	7		
	Mercury (H	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0		
	Nickel	mg/kg	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	<5.0	0	<5.0	2.0	0	<5.0	4.0	0		
	Zinc	mg/kg	5 (Primary): 1 (Interlab)	<5.0	<5.0	0	**7.2**	**21.0**	**98**	18.0	12.0	40	<5.0	3.0	0	7.2	11.0	42		
etalloids																				
Chlorinated	1,1,1,2-tetr	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	1,1,1-trichl	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	1,1,2,2-tetr	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	1,1,2-trichl	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	1,1-dichlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	1,2,3-trichl	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	1,2-dichlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	1,2-dichlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	1,3-dichlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Bromochlo	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Carbon tet	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Chloroetha	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Chloromet	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Dichlorodif	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Dichlorome	mg/kg	0.5	<0.5	<0.5	0				<0.5	<0.5	0	<0.5							
	Trichlorofl	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
l Alkanes																				
Chlorinated	1,1-dichlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	3-chloropro	mg/kg	0.5	<0.5	<0.5	0				<0.5	<0.5	0	<0.5							
	4-chlorotol	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	cis-1,2-dich	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	cis-1,3-dich	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Tetrachloro	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	trans-1,2-di	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	trans-1,3-di	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Trichloroet	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Vinyl Chlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
Alkenes																				
Trihalomet	Bromodich	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Chloroform	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Dibromoch	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Tribromom	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
xanes																				
TPHs (NEP	C6-C9 Fra	mg/kg	20 (Primary): 25 (Interlab	<20.0	<20.0	0							<20.0	<25.0	0					
	C10-C14 Fr	mg/kg	20 (Primary): 50 (Interlab	<20.0	<20.0	0							<20.0	<50.0	0					
	C15-C28 Fr	mg/kg	50 (Primary): 100 (Interla	<50.0	<50.0	0							<50.0	<100.0	0					
	C29-C36 Fr	mg/kg	50 (Primary): 100 (Interla	<50.0	<50.0	0							<50.0	<100.0	0					
	C10-C36 Fr	mg/kg	50	<50.0	<50.0	0							<50.0							
°C 1999)																				
TRHs (NEP	>C10-C16	mg/kg	50	<50.0	<50.0	0							<50.0	<50.0	0					
	>C16-C34	mg/kg	100	<100.0	<100.0	0							<100.0	<100.0	0					
	>C34-C40	mg/kg	100	<100.0	<100.0	0							<100.0	<100.0	0					
	>C10-C16	mg/kg	50	<50.0	<50.0	0							<50.0	<50.0	0					
	C6-C10 Fra	mg/kg	20 (Primary): 25 (Interlab	<20.0	<20.0	0							<20.0	<25.0	0					
	C6-C10 less	mg/kg	20 (Primary): 25 (Interlab	<20.0	<20.0	0							<20.0	<25.0	0					
°C 2013)																				
BTEX	Benzene	mg/kg	0.1 (Primary): 0.2 (Interla	<0.1	<0.1	0							<0.1	<0.2	0					
	Ethylbenze	mg/kg	0.1 (Primary): 1 (Interlab	<0.1	<0.1	0							<0.1	<1.0	0					
	Toluene	mg/kg	0.1							<0.1	<0.1	0								
	Toluene	mg/kg	0.1 (Primary): 0.5 (Interla	<0.1									<0.1	<0.5	0					
	Xylene (o)	mg/kg	0.1 (Primary): 1 (Interlab	<0.1	<0.1	0							<0.1	<1.0	0					
	Xylene (m	mg/kg	0.2 (Primary): 2 (Interlab	<0.2	<0.2	0							<0.2	<2.0	0					
	Xylene (To	mg/kg	0.3 (Primary): 1 (Interlab	<0.3	<0.3	0				<0.3	<0.3	0	<0.3	<1.0	0					
Polycyclic A	Acenaphth	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	Acenaphth	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	Anthracene	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	Benz(a)anth	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	Benzo(a)py	mg/kg	0.5 (Primary): 0.05 (Inter	<0.5	<0.5	0							<0.5	<0.05	0					
	Benzo(a)py	mg/kg	0.5	<0.5	<0.5	0							<0.5	<0.5	0					
	Benzo(a)py	mg/kg	0.5	0.6	0.6	0							0.6	<0.5	18					
	Benzo(a)py	mg/kg	0.5	1.2	1.2	0							**1.2**	**<0.5**	**82**					
	Benzo(b,j)fl	mg/kg	0.5	<0.5	<0.5	0							<0.5							
	Benzo(g,h,i	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	Benzo(k)flu	mg/kg	0.5	<0.5	<0.5	0							<0.5							
	Chrysene	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	Dibenz(a,h	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	Fluoranthe	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	Fluorene	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	Indeno(1,2	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	Naphthaler	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0							<0.5	<0.1	0					
	Naphthaler	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0							<0.5	<0.1	0					
	Phenanthre	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	Pyrene	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	PAHs (Tota	mg/kg	0.5	<0.5	<0.5	0							<0.5							
romatic Hydrocarbons																				
Monocyclic	1,2,4-trime	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	1,3,5-trime	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Bromoben	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Isopropylbe	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Styrene	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
Aromatic Hydrocarbons																				
Miscellaneo	1,2-dibrom	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	2-Butanone	mg/kg	0.5	<0.5	<0.5	0				<0.5	<0.5	0	<0.5							
	4-Methyl-2	mg/kg	0.5	<0.5	<0.5	0				<0.5	<0.5	0	<0.5							
	Bromomet	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Dibromome	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Iodomethan	mg/kg	0.5	<0.5	<0.5	0				<0.5	<0.5	0	<0.5							
us Hydrocarbons																				
Chlorinated	1,2-Dichlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	1,3-dichlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	1,4-dichlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Chloroben	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0				<0.5	<0.5	0	<0.5	<1.0	0					
	Hexachloro	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
Benzenes																				
Solvents	2-Propanol	mg/kg	0.5	<0.5	<0.5	0				<0.5	<0.5	0	<0.5							
Polychlorin	Aroclor 10	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	Aroclor 12	mg/kg	0.1	<0.1	<0.1	0							<0.1	<0.1	0					
	Aroclor 12	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	Aroclor 12	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	Aroclor 12	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	Aroclor 12	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	Aroclor 12	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
	PCBs (Tota	mg/kg	0.5 (Primary): 0.1 (Interla	<0.5	<0.5	0							<0.5	<0.1	0					
ated Biphenyls																				
Phenols	Phenols (T	mg/kg	0.1 (Primary): 5 (Interlab	<0.1	<0.1	0							<0.1	<5.0	0					
Organic Su	Carbon dis	mg/kg	0.5	<0.5	<0.5	0				<0.5	<0.5	0	<0.5							
ful Compounds																				
Organochl	4,4-DDE	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
	Aldrin	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
	alpha-BHC	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
	beta-BHC	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
	Dieldrin	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
	DDD	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
	DDT	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
	Chlordane	mg/kg	0.1	<0.1	<0.1	0							<0.1							
	delta-BHC	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
	Endosulfan	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
	Endosulfan	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
	Endosulfan	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
	Endrin	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
	Endrin alde	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
	Endrin ketc	mg/kg	0.05	<0.05	<0.05	0							<0.05							
	Heptachlor	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
	Heptachlor	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
	Lindane	mg/kg	0.05 (Primary): 0.1 (Inter	<0.05	<0.05	0							<0.05	<0.1	0					
	Methoxych	mg/kg	0.2 (Primary): 0.1 (Interla	<0.2	<0.2	0							<0.2	<0.1	0					
	Toxaphene	mg/kg	1	<1.0	<1.0	0							<1.0							
rine Pesticides																				
Asbestos	Approx. Sa	G		506.0	752.0	39							506.0							
	Asbestos fi	%w/w		0.0	0.0	0							0.0							
	Asbestos fi	%w/w		0.0	0.0	0							0.0							
	Mass ACM	G		0.0	0.0	0							0.0							
	Mass Asbe	G		0.0	0.0	0							0.0							
	Mass FA	G		0.0	0.0	0							0.0							
	Mass Asbe	G		0.0	0.0	0							0.0							
	Mass AF	G		0.0	0.0	0							0.0							
	Mass Asbe	G		0.0	0.0	0							0.0							
	Mass Asbe	G		0.0	0.0	0							0.0							
Asbestos -	ACM - Con	COMMENT		1.0	1.0	0							1.0							
	AF - Comm	COMMENT		1.0	1.0	0							1.0							
	FA - Comm	COMMENT		1.0	1.0	0							1.0							
	Organic Fib	COMMENT		1.0	1.0	0							1.0							
	Respirable	COMMENT		1.0	1.0	0							1.0							
	Synthetic F	COMMENT		1.0	1.0	0							1.0							
Trace Analysis																				
Other	% Moisture	%	1	8.1	6.4	23	8.9	14.0	45	25.0	23.0	8	8.1			8.9				

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (1-20 x EQL); 30 (20-30 x EQL); 30 (> 30 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Field Duplicates (WATER)
Filter: ALL

SDG	548083	548083		548083	548083		548083	ENVIROLAB 2017-05-29T00:00:00	
Field ID	PSM01	QC01_W	**RPD**	PSM01	QC01_W	**RPD**	PSM01	QC01-W/A	**RPD**
Sampled Date/Time	5/26/2017	5/26/2017		5/26/2017	5/26/2017		5/26/2017	5/26/2017	

Chem_Gro	ChemNam	Units	EQL									
Metals & M	Arsenic (T	mg/l	0.001	0.001	<0.001	0				0.001	<0.001	0
	Cadmium	mg/l	0.0002 (Primary): 0.0001	<0.0002	<0.0002	0				<0.0002	<0.0001	0
	Chromium	mg/l	0.001	<0.001	0.001	0				<0.001	<0.001	0
	Copper (Fi	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	Lead (Filte	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	Mercury (I	mg/l	0.0001 (Primary): 0.0000	**0.0002**	**<0.0001**	**67**				**0.0002**	**<0.0001**	**120**
	Nickel (Filt	mg/l	0.001	0.004	0.004	0				0.004	0.005	22
	Zinc (Filter	mg/l	0.005 (Primary): 0.001 (	<0.005	<0.005	0				<0.005	0.003	0
etalloids												
Chlorinated	1,1,1,2-tetr	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	1,1,1-trichl	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	1,1,2,2-tetr	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	1,1,2-trichl	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	1,1-dichlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	1,2,3-trichl	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	1,2-dichlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	1,2-dichlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	1,3-dichlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	Bromochlo	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	Carbon tet	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	Chloroetha	mg/l	0.001 (Primary): 0.01 (Ir	<0.001	<0.001	0				<0.001	<0.01	0
	Chlorometl	mg/l	0.001 (Primary): 0.01 (Ir	<0.001	<0.001	0				<0.001	<0.01	0
	Dichlorodif	mg/l	0.001 (Primary): 0.01 (Ir	<0.001	<0.001	0				<0.001	<0.01	0
	Dichlorom	mg/l	0.001	<0.001	<0.001	0				<0.001		
	Trichlorofl	mg/l	0.001 (Primary): 0.01 (Ir	<0.001	<0.001	0				<0.001	<0.01	0
l Alkanes												
Chlorinated	1,1-dichlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	3-chloropr	mg/l	0.001	<0.001	<0.001	0				<0.001		
	4-chlorotol	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	cis-1,2-dic	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	cis-1,3-dic	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	Tetrachlor	mg/l	0.001	0.059	0.051	15				0.059	0.049	19
	trans-1,2-d	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	trans-1,3-d	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	Trichloroet	mg/l	0.001	<0.001	<0.001	0				<0.001	0.001	0
	Vinyl Chlor	mg/l	0.001 (Primary): 0.01 (Ir	<0.001	<0.001	0				<0.001	<0.01	0
l Alkenes												
Trihalomet	Bromodich	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	Chloroform	mg/l	0.005 (Primary): 0.001 (	<0.005	<0.005	0				<0.005	<0.001	0
	Dibromoch	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	Tribromom	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
nanes												
TPHs (NEI	C6-C9 Fra	mg/l	0.02 (Primary): 0.01 (Int	0.15	0.15	0				0.15	0.15	0
	C10-C14 F	mg/l	0.05	<0.05	<0.05	0				<0.05	<0.05	0
	C15-C28 F	mg/l	0.1	**1.1**	**0.4**	**93**				**1.1**	**0.18**	**144**
	C29-C36 F	mg/l	0.1	0.1	<0.1	0				0.1	<0.1	0
	C10-C36 F	mg/l	0.1	**1.2**	**0.4**	**100**				1.2		
C 1999)												
TRHs (NEI	>C10-C16	mg/l	0.05	<0.05	<0.05	0				<0.05	<0.05	0
	>C16-C34	mg/l	0.1	**1.2**	**0.4**	**100**				**1.2**	**0.16**	**153**
	>C34-C40	mg/l	0.1	<0.1	<0.1	0				<0.1	<0.1	0
	>C10-C16	mg/l	0.05	<0.05	<0.05	0				<0.05	<0.05	0
	C6-C10 Fr	mg/l	0.02 (Primary): 0.01 (Int	0.15	0.15	0				0.15	0.17	13
	C6-C10 les	mg/l	0.02 (Primary): 0.01 (Int	0.08	0.08	0				0.08	0.076	5
C 2013)												
BTEX	Benzene	mg/l	0.001	<0.001						<0.001	<0.001	0
	Ethylbenze	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	Toluene	mg/l	0.001	0.073	0.072	1				0.073	0.094	25
	Xylene (o)	mg/l	0.001	<0.001						<0.001	<0.001	0
	Xylene (m	mg/l	0.002	<0.002						<0.002	<0.002	0
Polycyclic A	Acenaphth	mg/l	0.00005				<0.0001	<0.0001	0			
	Acenaphth	mg/l	0.00005				<0.0001	<0.0001	0			
	Anthracen	mg/l	0.00005				<0.0001	<0.0001	0			
	Benz(a)an	mg/l	0.00005				<0.0001	<0.0001	0			
	Benzo(a)p	mg/l	0.00001				<0.0	0.0	0			
	Benzo(b,j)f	mg/l	0.00005				<0.0001	<0.0001	0			
	Benzo(g,h,	mg/l	0.00005				<0.0001	<0.0001	0			
	Benzo(k)flu	mg/l	0.00005				<0.0001	<0.0001	0			
	Chrysene	mg/l	0.00005				<0.0001	<0.0001	0			
	Dibenz(a,h	mg/l	0.00005				<0.0001	<0.0001	0			
	Fluoranthe	mg/l	0.00005				<0.0001	<0.0001	0			
	Fluorene	mg/l	0.00005				<0.0001	<0.0001	0			
	Indeno(1,2	mg/l	0.00005				<0.0001	<0.0001	0			
	Naphthale	mg/l	0.01 (Primary): 0.001 (Ir	<0.01	<0.01	0				<0.01	<0.0002	0
	Naphthale	mg/l	0.00005				0.0001	0.0002	35			
	Phenanthr	mg/l	0.00005				0.0001	0.0001	46			
	Pyrene	mg/l	0.00005				<0.0001	<0.0001	0			
	PAHs (Tot	mg/l	0.00005				0.0002	0.0003	17			
Aromatic Hydrocarbons												
Monocyclic	1,2,4-trime	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	1,3,5-trime	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	Bromoben	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	Isopropylb	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	Styrene	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
Aromatic Hydrocarbons												
Miscellane	1,2-dibrom	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	2-Butanon	mg/l	0.001	<0.001	<0.001	0				<0.001		
	4-Methyl-2	mg/l	0.001	<0.001	<0.001	0				<0.001		
	Bromomet	mg/l	0.001 (Primary): 0.01 (Ir	<0.001	<0.001	0				<0.001	<0.01	0
	Dibromom	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	Iodometha	mg/l	0.001	<0.001	<0.001	0				<0.001		
ous Hydrocarbons												
Chlorinated	1,2-Dichlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	1,3-dichlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	1,4-dichlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
	Chloroben	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0
l Benzenes												
Solvents	2-Propano	µg/l	1	21.0	21.0	0				21.0		
Organic Su	Carbon dis	mg/l	0.001	<0.001	<0.001	0				<0.001		

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (1-20 x EQL); 30 (20-30 x EQL); 30 (> 30 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laborat

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Contents

Surrogate Variation > 30% or outside lab LCL or UCL

SDG	Expr1001	Lab_Report_Number	Sample_Type	Matrix_Type	SampleCode	Field_ID	Depth	Sampled_Date-Time	Compound	Recovery %	Unit	LCL	UCL	Lab_Qualifier	Lab_Comments
545235	545235	545235	Normal	SOIL	S17-My07740	JB11_0.05-0.15	0.05 - 0.15	5/6/2017	Dibutylchlorendate (surr.)	134	%	70	130		
545235	545235	545235	Normal	SOIL	S17-My07851	JB17_0.1-0.25	0.1 - 0.25	5/7/2017	4-Bromofluorobenzene (surr.)	141	%	70	130		
545235	545235	545235	Normal	SOIL	S17-My07857	JB14_0.1-0.3	0.1 - 0.3	5/7/2017	4-Bromofluorobenzene (surr.)	149	%	70	130		
545235	545235	545235	Normal	SOIL	S17-My07879	JB01_0.05-0.3	0.05 - 0.3	5/7/2017	p-Terphenyl-d14 (surr.)	134	%	30	130		
545235	545235	545235	Rinsate	WATER	S17-My07886	RINS 6-5-17	RINS	5/6/2017	p-Terphenyl-d14 (surr.)	142	%	30	130		
545235	545235	545235	Rinsate	WATER	S17-My07887	RINS 7-5-17	RINS	5/7/2017	p-Terphenyl-d14 (surr.)	145	%	30	130		
545643	545643	545643	Normal	GAS	S17-My10374	SV05_FRONT	FRONT	5/5/2017	Fluorobenzene (surr.)	132	%	50	150		
548083	548083	548083	Rinsate	WATER	S17-My29209	RINS	RINS	5/26/2017	Fluorobenzene (surr.)	67	%	50	150		
548083	548083	548083	Rinsate	WATER	S17-My29209	RINS	RINS	5/26/2017	Tetrachloro-m-xylene (surr.)	62	%	70	130		
548083	548083	548083	Rinsate	WATER	S17-My29209	RINS	RINS	5/26/2017	2-Fluorobiphenyl (surr.)	0	%	30	130		
548083	548083	548083	Rinsate	WATER	S17-My29209	RINS	RINS	5/26/2017	p-Terphenyl-d14 (surr.)	0	%	30	130		
548083	548083	548083	Rinsate	WATER	S17-My29209	RINS	RINS	5/26/2017	Phenol-d6 (surr.)	0	%	20	130		
548083	548083	548083	Normal	SOIL	S17-My29193	JHA01_0.25-0.4	JHA010.25 -	5/26/2017	2-Fluorobiphenyl (surr.)	146	%	30	130		
548083	548083	548083	Normal	SOIL	S17-My29193	JHA01_0.25-0.4	JHA010.25 -	5/26/2017	4-Bromofluorobenzene (surr.)	68	%	70	130		
548083	548083	548083	Normal	SOIL	S17-My29195	JHA02_0.3-0.5	JHA020.3 - 0	5/26/2017	4-Bromofluorobenzene (surr.)	63	%	70	130		
548083	548083	548083	Normal	SOIL	S17-My29196	JHA04_0.2-0.4	JHA040.2 - 0	5/26/2017	p-Terphenyl-d14 (surr.)	67	%	30	130		
548083	548083	548083	Normal	SOIL	S17-My29200	JHA06_0.4-0.6	JHA060.4 - 0	5/26/2017	4-Bromofluorobenzene (surr.)	65	%	70	130		
548083	548083	548083	Normal	SOIL	S17-My29202	JHA07_0.4-0.6	JHA070.4 - 0	5/26/2017	Fluorobenzene (surr.)	63	%	50	150		
548083	548083	548083	Normal	SOIL	S17-My29203	JHA07_1.3-1.5	JHA071.3 - 1	5/26/2017	Fluorobenzene (surr.)	59	%	50	150		
548083	548083	548083	Normal	WATER	S17-My29206	PSM01	PSM01	5/26/2017	Fluorobenzene (surr.)	68	%	50	150		
548083	548083	548083	Field_D	WATER	S17-My29212	QC01_W	PSM01	5/26/2017	Fluorobenzene (surr.)	69	%	50	150		
548083	548083	548083	Field_D	SOIL	S17-My29213	QC20170526-1	JHA07	5/26/2017	Fluorobenzene (surr.)	59	%	50	150		
548083	548083	548083	Normal	WATER	S17-My29214	PSM01	PSM01	5/26/2017	2-Fluorobiphenyl (surr.)	67	%	30	130		
548083	548083	548083	Normal	WATER	S17-My29215	PSM02	PSM02	5/26/2017	2-Fluorobiphenyl (surr.)	67	%	30	130		
548083	548083	548083	Normal	WATER	S17-My29216	PSM03	PSM03	5/26/2017	2-Fluorobiphenyl (surr.)	68	%	30	130		
548083	548083	548083	Field_D	WATER	S17-My29217	QC01_W	PSM01	5/26/2017	2-Fluorobiphenyl (surr.)	63	%	30	130		

Contents

Laboratory Control Samples, Error > 30%

SDG	Matrix_Type	SampleCode	Method_Name	OriginalChemName	Recovery %	Unit	Result_Type	Lab_Comments
548083	WATER	LCS_13_548083	E008 Speciated Phenols	2-Methylphenol (o-Cresol)	61	%	REG	
548083	WATER	LCS_13_548083	E008 Speciated Phenols	3&4-Methylphenol (m&p-Cresol)	54	%	REG	

Contents

Matrix Spike Recoveries less than 70% or greater than 130% or outside lab LCL or UCL

SDG	Lab_Report_Number	Matrix_Type	SampleCode	Field_ID	Depth	Sampled_Date-Time	Method_Name	Compound	Recovery %	Result_Type	Lab_Comments
ENVIROLAB 2017-05-11T00:00:00	166525	SOIL	166525-1MS				Org-014 - VOC in soil	dibromochloromethane	131	REG	
548083	548083	SOIL	S17-My29201-SPK	JHA06_1.0-1.2	JHA061 - 1.2	5/26/2017	E013 Organochlorine Pesticides (OC)	Heptachlor	51	SC	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference

Contents

Trip Spike Recoveries (70% - 130% is acceptable)

SDG	Lab_Report_Number	Matrix_Type	SampleCode	Field_ID	Method_Name	Compound	Trip_Spike_Result	Trip_Spike_Control	Result_Units	Spike_Recovery_%	Acceptable	Result_Type	Lab_Comments
545235	545235	WATER	S17-My07889	TS	TRH C6-C40 - LTM-ORG-2010	Benzene	NA	NA	NA	105	Y	REG	
545235	545235	WATER	S17-My07889	TS	TRH C6-C40 - LTM-ORG-2010	Ethylbenzene	NA	NA	NA	92	Y	REG	
545235	545235	WATER	S17-My07889	TS	TRH C6-C40 - LTM-ORG-2010	m&p-Xylenes	NA	NA	NA	88	Y	REG	
545235	545235	WATER	S17-My07889	TS	TRH C6-C40 - LTM-ORG-2010	o-Xylene	NA	NA	NA	85	Y	REG	
545235	545235	WATER	S17-My07889	TS	TRH C6-C40 - LTM-ORG-2010	Toluene	NA	NA	NA	92	Y	REG	
545235	545235	WATER	S17-My07889	TS	TRH C6-C40 - LTM-ORG-2010	Xylenes - Total	NA	NA	NA	87	Y	REG	
548083	548083	WATER	S17-My29210	TS	TRH C6-C40 - LTM-ORG-2010	Benzene	NA	NA	NA	111	Y	REG	
548083	548083	WATER	S17-My29210	TS	TRH C6-C40 - LTM-ORG-2010	Ethylbenzene	NA	NA	NA	92	Y	REG	
548083	548083	WATER	S17-My29210	TS	TRH C6-C40 - LTM-ORG-2010	m&p-Xylenes	NA	NA	NA	102	Y	REG	
548083	548083	WATER	S17-My29210	TS	TRH C6-C40 - LTM-ORG-2010	o-Xylene	NA	NA	NA	103	Y	REG	
548083	548083	WATER	S17-My29210	TS	TRH C6-C40 - LTM-ORG-2010	Toluene	NA	NA	NA	98	Y	REG	
548083	548083	WATER	S17-My29210	TS	TRH C6-C40 - LTM-ORG-2010	Xylenes - Total	NA	NA	NA	103	Y	REG	

Appendix N Field Borehole Logs

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB01

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/07/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - GRAVEL Subgrade		
		0.05		Fill	Fill - Sandy CLAY - dark brown, heterogeneous, loose, damp, organic colouration/odour, small glass fragments	JB01 0.05-0.3 PID = 0.4 ppm	No Odours, No Staining, No ACM
		0.30		CL-ML	Sandy CLAY - red-brown/ light brown with grey mottles, homogeneous, firm, damp, medium-high plasticity	JB01 0.3-0.4 PID = 0.1 ppm	No Odours, No Staining, No ACM
	0.5						
	1.0					JB01 1.1-1.2 PID = 0.1 ppm	No Odours, No Staining, No ACM
		1.20			Borehole JB01 terminated at 1.2m		
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB02

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/07/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - GRAVEL Subgrade		
		0.05		Fill	Fill - Sandy CLAY - brown-light brown, heterogeneous, loose, dry, brick and gravel fragments	JB02 0.05-0.25 PID = 0.3 ppm	No Odours, No Staining, No ACM
		0.25		CL-ML	Silty CLAY - light brown with grey mottles, homogeneous, firm, damp, medium-high plasticity	JB02 0.25-0.35 PID = 0.1 ppm	No Odours, No Staining, No ACM
	0.5						
	1.0					JB02 1.1-1.2 PID = 0.1 ppm	No Odours, No Staining, No ACM
		1.20			Borehole JB02 terminated at 1.2m		
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB03

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/07/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - GRAVEL Subgrade		
		0.05		Fill	Fill - Silty SAND - grey, heterogeneous, loose, damp, medium-fine grained, gravel throughout	JB03 0.05-0.2 PID = 0.2 ppm	No Odours, No Staining, No ACM
		0.20		Fill	Sandy CLAY - dark brown, heterogeneous, loose, damp, inclusions of small metal fragments	JB03 0.2-0.45 PID = 0.2 ppm	No Odours, No Staining, No ACM
	0.5	0.45		CL-ML	Silty CLAY - light brown with grey-orange mottles, homogeneous, firm, medium-high plasticity	JB03 0.45-0.65 PID = 0.1 ppm	No Odours, No Staining, No ACM
	1.0						
						JB03 1.1-1.2 PID = 0.1 ppm	No Odours, No Staining, No ACM
		1.20			Borehole JB03 terminated at 1.2m		
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 19/5/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB04

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/07/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - ASPHALT Layer		
		0.10		Fill	Fill - Sandy CLAY - light brown with red mottles, heterogeneous, loose, dry, brick and gravel fragments	JB04 0.1-0.2 PID = 0.2 ppm	No Odours, No Staining, No ACM
	0.5					JB04 0.4-0.5 PID = 0.2 ppm	No Odours, No Staining, No ACM
		0.50		CL-ML	Silty CLAY - light brown with grey mottles, homogeneous, firm, damp, medium-high plasticity	JB04 0.5-0.6 PID = 0.1 ppm	No Odours, No Staining, No ACM
	1.0						
						JB04 1.1-1.2 PID = 0.2 ppm	No Odours, No Staining, No ACM
		1.20			Borehole JB04 terminated at 1.2m		
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB05

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/07/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - ASPHALT Layer		
		0.10		Fill	Fill - Sandy CLAY - light brown with red mottles, heterogeneous, loose, dry, metal, glass and brick fragments	JB05 0.1-0.2 PID = 0.3 ppm	No Odours, No Staining, No ACM
	0.5					JB05 0.5-0.6 PID = 0.1 ppm	No Odours, No Staining, No ACM
		0.60		CL-ML	Silty CLAY - light brown with grey mottles, homogeneous, firm, damp, medium-high plasticity	JB05 0.6-0.7 PID = 0.1 ppm	No Odours, No Staining, No ACM
	1.0					JB05 1.1-1.2 PID = 0.2 ppm	No Odours, No Staining, No ACM
		1.20			Borehole JB05 terminated at 1.2m		
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB06

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/06/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - ASPHALT Layer		
		0.10		Fill	Fill - Sandy CLAY - yellow/ brown, heterogeneous, dample medium plasticity, medium sized black-orange gravels	JB06 0.1-0.2 PID = 0.1 ppm	No Odours, No Staining, No ACM
	0.5	0.40		CL-ML	Silty CLAY - grey, homogeneous, firm, low plasticity	JB06 0.4-0.5 PID = 0.1 ppm	No Odours, No Staining, No ACM
		0.60		CL-ML	Silty CLAY - light grey, homogeneous, firm, low plasticity		
	1.0						
		1.20			Borehole JB06 terminated at 1.2m		
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB07

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/07/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - ASPHALT Layer		
		0.10		Fill	Fill - Sandy CLAY - orange/ yellow, heterogeneous, dry, loose, medium-fine grained sands, gravel throughout	JB07 0.1-0.2 PID = 0.2 ppm	No Odours, No Staining, No ACM
		0.20		CL-ML	Silty CLAY - light brown with grey mottles, homogeneous, firm, medium-high plasticity	JB07 0.2-0.3 PID = 0.1 ppm	No Odours, No Staining, No ACM
	0.5						
	1.0					JB07 1.1-1.2 PID = 0.1 ppm	No Odours, No Staining, No ACM
		1.20			Borehole JB07 terminated at 1.2m		
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB08

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/06/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - ASPHALT Layer		
		0.10		Fill	Fill - Sandy CLAY - yellow/ brown, heterogeneous, damp, medium plasticity, medium sized red-blue gravels	JB08 0.1-0.2 PID = 0.2 ppm	No Odours, No Staining, No ACM
		0.20		CL-ML	Silty CLAY - dark grey/ brown with orange mottles, homogeneous, firm, damp, high plasticity	JB08 0.2-0.3 PID = 0.1 ppm	No Odours, No Staining, No ACM
	0.5						
		0.60		CL-ML	Silty CLAY - light grey/ brown with increased orange mottles, homogeneous, firm, damp, high plasticity	JB08 0.6-0.7 PID = 0 ppm	No Odours, No Staining, No ACM
	1.0						
		1.20			Borehole JB08 terminated at 1.2m		
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 19/5/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB09

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/06/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - ASPHALT Layer		
		0.15		Fill	Fill - Sandy CLAY - yellow/ brown, heterogeneous, damp, medium plasticity, medium sized red-orange-blue gravels	JB09 0.15-0.2 PID = 0.1 ppm	No Odours, No Staining, No ACM
		0.20		CL-ML	Silty CLAY - dark grey/ brown with orange mottles, homogeneous, firm, damp, high plasticity	JB09 0.2-0.3 PID = 0.1 ppm	No Odours, No Staining, No ACM
	0.5	0.45		CL-ML	Silty CLAY - light grey/ brown with increased orange mottles, homogeneous, firm, damp, high plasticity	JB09 0.45-0.55 PID = 0.1 ppm	No Odours, No Staining, No ACM
	1.0						
		1.20			Borehole JB09 terminated at 1.2m		
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 19/5/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB10

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/07/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - ASPHALT Layer		
		0.10		Fill	Fill - Sandy CLAY - orange/ brown, heterogeneous, damp, loose, fine-grained sand, medium-large gravels, minor ash	JB10 0.1-0.2 PID = 0 ppm	No Odours, No Staining, No ACM
						JB10 0.3-0.4 PID = 0.1 ppm	No Odours, No Staining, No ACM
		0.40		CL-ML	Silty CLAY - brown/ light brown with grey-orange mottles, firm, damp, medium-high plasticity	JB10 0.4-0.5 PID = 0.1 ppm	No Odours, No Staining, No ACM
	0.5						
	1.0					JB10 1-1.2 PID = 0.1 ppm	No Odours, No Staining, No ACM
		1.20			Borehole JB10 terminated at 1.2m		
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 19/5/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB11

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/06/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - Silty SAND - Silty Sandy Mulch	JB11 0-0.05 PID = 0 ppm	No Odours, No Staining, No ACM
		0.05		Fill	Fill - Silty SAND - brown, heterogeneous, loose, sub-rounded, medium-fine grained, root inclusions	JB11 0.05-0.15 PID = 0.1 ppm	No Odours, No Staining, No ACM
		0.25		Fill	Fill - Gravelly SILT - light yellow/ brown, heterogeneous, soft, wet, fine-grained	JB11 0.25-0.35 PID = 0.1 ppm	No Odours, No Staining, No ACM
		0.35		CL-ML	Silty CLAY - light brown with orange-red mottles, homogeneous, firm, medium plasticity	JB11 0.35-0.45 PID = 0.1 ppm	No Odours, No Staining, No ACM
	0.5						
	1.0						
		1.20			Borehole JB11 terminated at 1.2m		
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 19/5/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB12

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/07/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - ASPHALT Layer		
		0.10		Fill	Fill - Sandy CLAY - dark brown, heterogeneous, loose, dry, medium-fine grained sand, gravel throughout	JB12 0.1-0.25 PID = 0.2 ppm	No Odours, No Staining, No ACM
		0.25		CL-ML	Silty CLAY - light brown with grey-orange mottles, homogeneous, firm, damp, medium-high plasticity	JB12 0.25-0.35 PID = 0.2 ppm	No Odours, No Staining, No ACM
	0.5						
	1.0					JB12 1.1-1.2 PID = 0.1 ppm	No Odours, No Staining, No ACM
		1.20			Borehole JB12 terminated at 1.2m		
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 19/5/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB13

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/07/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - ASPHALT Layer		
		0.10		Fill	Fill - Clayey SAND - red/ brown, heterogeneous, loose, dry, trace gravel inclusions	JB13 0.1-0.2 PID = 0.2 ppm	No Odours, No Staining, No ACM
		0.20		CL-ML	Silty CLAY - light brown with grey-orange mottles, homogeneous, damp, firm, medium-high plasticity	JB13 0.2-0.3 PID = 0.1 ppm	No Odours, No Staining, No ACM
	0.5						
	1.0					JB13 1.1-1.2 PID = 0.1 ppm	No Odours, No Staining, No ACM
		1.20			Borehole JB13 terminated at 1.2m		
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 19/5/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB14

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/07/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - ASPHALT Layer		
		0.10		Fill	Fill - Sandy CLAY - red-brown/ dark brown, heterogeneous, organic colouration/odour, gravel throughout	JB14 0.1-0.3 PID = 0.2 ppm	No Odours, No Staining, No ACM
		0.30		CL-ML	Silty CLAY - light brown with grey mottles, homogeneous, firm, damp, medium-high plasticity	JB14 0.3-0.4 PID = 0.1 ppm	No Odours, No Staining, No ACM
	0.5						
	1.0					JB14 1.1-1.2 PID = 0.1 ppm	No Odours, No Staining, No ACM
		1.20			Borehole JB14 terminated at 1.2m		
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 19/5/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB15

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/06/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 2.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - ASPHALT Layer		
		0.10		Fill	Fill - Sandy CLAY - yellow/ brown, heterogeneous, damp, medium plasticity, blue-orange fine-medium gravels	JB15 0.1-0.2 PID = 0.2 ppm	No Odours, No Staining, No ACM
		0.40		Fill	Fill - Silty CLAY - dark grey/ brown, heterogeneous, damp, medium plasticity, blue-orange fine-medium gravels	JB15 0.4-0.5 PID = 0.1 ppm	No Odours, No Staining, No ACM
	0.5	0.50		CL-ML	Silty CLAY - grey-brown with orange-light grey mottles, homogeneous, firm	JB15 0.5-0.6 PID = 0.1 ppm	No Odours, No Staining, No ACM
		0.70		CL-ML	Silty CLAY - light brown with orange-light grey mottles, homogeneous, firm		
	1.0						
	1.5						
	2.0						
		2.00		CL-ML	Silty CLAY - grey with orange-light grey mottles, homogeneous, firm		
		2.20			Borehole JB15 terminated at 2.2m		
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 19/5/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB16

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/06/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - ASPHALT Layer		
		0.05		Fill	Fill - Sandy SILT - light grey, heterogeneous, soft, damp, non-plastic, blue-orange-red fine-medium grained gravels	JB16 0.05-0.15 PID = 0.2 ppm	No Odours, No Staining, No ACM
		0.35		CL-ML	Silty CLAY - grey with orange mottles, homogeneous, firm, damp, high plasticity	JB16 0.35-0.45 PID = 0.1 ppm	No Odours, No Staining, No ACM
	0.5	0.45		CL-ML	Silty CLAY - light grey with increas increased orange mottles, homogeneous, firm, damp, high plasticity		
	1.0						
		1.20			Borehole JB16 terminated at 1.2m		
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 19/5/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB17

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/07/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - ASPHALT Layer		
		0.10		Fill	Fill - Sandy CLAY - orange/ brown, heterogeneous, dry, loose, fine-grained sand, gravel throughout	JB17 0.1-0.25 PID = 0.2 ppm	No Odours, No Staining, No ACM
		0.25		CL-ML	Silty CLAY - light brown with grey mottles, homogeneous, damp, firm, medium-high plasticity	JB17 0.25-0.35 PID = 0.1 ppm	No Odours, No Staining, No ACM
	0.5						
	1.0					JB17 1.1-1.2 PID = 0.1 ppm	No Odours, No Staining, No ACM
		1.20			Borehole JB17 terminated at 1.2m		
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 19/5/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB18

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/06/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 2.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - ASPHALT Layer		
		0.10		Fill	Fill - Sandy CLAY - yellow/ brown, heterogeneous, damp, medium plasticity, blue-orange fine-medium gravels	JB18 0.1-0.2 PID = 0.1 ppm	No Odours, No Staining, No ACM
	0.5	0.40		Fill	Fill - Silty CLAY - grey/ brown with orange/ light grey mottles, homogeneous, soft, small charcoal pieces	JB18 0.4-0.5 PID = 0.1 ppm	No Odours, No Staining, No ACM
		0.60		CL-ML	Fill - Silty CLAY - light brown with orange/ light grey mottles, homogeneous, firm	JB18 0.6-0.7 PID = 0.1 ppm	No Odours, No Staining, No ACM
	1.0						
		1.40		CL-ML	Fill - Silty CLAY - light grey with orange/ light grey mottles, homogeneous, firm		
	1.5						
	2.0						
		2.20			Borehole JB18 terminated at 2.2m		
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 19/5/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB19

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/06/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 3.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - ASPHALT Layer		
		0.10		Fill	Fill - Sandy CLAY - yellow/ brown, heterogeneous, damp, medium plasticity, blue-orange fine-medium gravels	JB19 0.1-0.2 PID = 0.2 ppm	No Odours, No Staining, No ACM
		0.30		Fill	Fill - Silty Gravelly SAND - light yellow/ brown, heterogeneous, dry, fine blue gravels	JB19 0.3-0.4 PID = 0.1 ppm	No Odours, No Staining, No ACM
	0.5						
	1.0					JB19 0.9-1 PID = 0.1 ppm	No Odours, No Staining, No ACM
	1.5						
		1.60		Fill	Fill - Silty Gravelly SAND - light yellow/ brown, heterogeneous, saturated, coarse blue gravels	JB19 1.6-1.7 PID = 0 ppm	No Odours, No Staining, No ACM
		1.80		CL-ML	Silty CLAY - light brown with grey-orange mottles, stiff, damp, high plasticity	JB19 1.8-1.9 PID = 0 ppm	No Odours, No Staining, No ACM
	2.0						
	2.5						
	3.0						
		3.20			Borehole JB19 terminated at 3.2m		
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 19/5/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JB20

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 5/06/2017
Logged By: Sarah Gray
Contractor: Terratest
Total Hole Depth (mbgs): 3.2
Bore Diameter (mm): 125

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Push Tube				Fill	Fill - ASPHALT Layer		
		0.05		Fill	Fill - Sandy CLAY - yellow/ brown, heterogeneous, damp, orange-brown fine-medium gravels	JB20 0.05-0.15 PID = 0.1 ppm	No Odours, No Staining, No ACM
	0.5						
		0.50		Fill	Fill - Gravelly Silty SAND - light yellow-brown, heterogeneous, dry, sub-rounded, fine blue gravels	JB20 0.5-0.6 PID = 0.1 ppm	No Odours, No Staining, No ACM
	1.0						
		1.15		Fill	Fill - Silty CLAY - red/ brown, heterogeneous, high plasticity, stiff, fine blue gravels	JB20 1.15-1.25 PID = 0.2 ppm	No Odours, No Staining, No ACM
		1.25		Fill	Fill - Silty CLAY - brown, heterogeneous, firm, medium plasticity, fine blue gravels	JB20 1.25-1.35 PID = 0.1 ppm	No Odours, No Staining, No ACM
	1.5						
		1.50		Fill	Fill - Sandy GRAVEL - brown, heterogeneous, angular, medium-density, fine blue gravels	JB20 1.5-1.6 PID = 0.2 ppm	No Odours, No Staining, No ACM (Bag Collected)
						JB20 1.7-1.8 PID = 0.2 ppm	Slight Odour - No Staining, No ACM (Bag Collected)
		1.80		Fill	Silty CLAY - black, heterogeneous, damp, low plasticity		
		1.90		CL-ML	Silty CLAY - black, heterogeneous, wet, low plasticity	JB20 1.9-2 PID = 0.2 ppm	No Odours, No Staining, No ACM
	2.0						
		2.00		CL-ML	Silty CLAY - brown, homogeneous, wet, stiff		
		2.20		CL-ML	Silty CLAY - grey, homogeneous, wet, stiff		
	2.5						
	3.0						
		3.20			Borehole JB20 terminated at 3.2m		
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 19/5/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JHA01

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 26/05/2017
Logged By: Rohan Hammond
Contractor:
Total Hole Depth (mbgs): 0.7
Bore Diameter (mm): 150

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - CONCRETE slab		
		0.25		Fill	Fill - SAND - yellow/ brown, homogeneous, poorly graded, coarse, angular, inclusions of soft dark brown clay	JHA01 0.25-0.4 PID = 0 ppm	No Odours, No Staining, No ACM identified
	0.5	0.40		SC	Silty CLAY - yellow/ grey with mottles, high plasticity, no inclusions	JHA01 0.4-0.6 PID = 0 ppm	No Odours, No Staining, No ACM identified
		0.70			Borehole JHA01 terminated at 0.7m		
	1.0						
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 7/9/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JHA02

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 26/05/2017
Logged By: Rohan Hammond
Contractor:
Total Hole Depth (mbgs): 0.5
Bore Diameter (mm): 150

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - CONCRETE slab		
		0.10		Fill	Fill - Gravelly SAND - yellow/ brown, heterogeneous, damp, poorly graded, coarse, inclusions of silt and brick	JHA02 0.1-0.3 PID = 0 ppm	No Odours, No Staining, No ACM identified
		0.30		Fill	Fill - Gravelly SAND - brown-black, heterogeneous, poorly graded, coarse, angular, dense, inclusions of brick, concrete and slag	JHA02 0.3-0.5 PID = 0 ppm	No Odours, No Staining, No ACM identified
	0.5						
		0.50			Borehole JHA02 terminated at 0.5m		Refusal
	1.0						
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 7/9/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JHA03

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 26/05/2017
Logged By: Rohan Hammond
Contractor:
Total Hole Depth (mbgs): 0.5
Bore Diameter (mm): 150

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger	0.5			Fill	Fill - Gravelly SAND - brown, heterogeneous, dry, poorly graded, coarse sands with fine gravels, angular, dense, inclusions of bark	JHA03 0-0.2 PID = 0 ppm	No Odours, No Staining, No ACM identified
						JHA03 0.3-0.5 PID = 0 ppm	No Odours, No Staining, No ACM identified
		0.50			Borehole JHA03 terminated at 0.5m		Refusal on tree roots
	1.0						
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 7/9/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JHA04

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 26/05/2017
Logged By: Rohan Hammond
Contractor:
Total Hole Depth (mbgs): 0.8
Bore Diameter (mm): 150

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - CONCRETE slab		
		0.20		Fill	Fill - Gravelly SAND - brown, heterogeneous, wet, poorly graded, coarse gravels, angular, inclusions of brick, gravels and terracotta	JHA04 0.2-0.4 PID = 0 ppm	No Odours, No Staining, No ACM identified
	0.5	0.40		CL-ML	Silty CLAY - grey, heterogeneous, dense, medium plasticity, stiff, damp	JHA04 0.4-0.6 PID = 0 ppm	No Odours, No Staining, No ACM identified
						JHA04 0.6-0.8 PID = 0 ppm	No Odours, No Staining, No ACM identified
		0.80			Borehole JHA04 terminated at 0.8m		
	1.0						
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 7/9/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JHA05

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 26/05/2017
Logged By: Rohan Hammond
Contractor:
Total Hole Depth (mbgs): 0.5
Bore Diameter (mm): 150

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger	0.5			Fill	Fill - Gravelly SAND - brown, heterogeneous, dry, poorly graded, coarse sands with fine gravels, angular, dense, inclusions of tree roots	JHA05 0-0.2 PID = 0 ppm	No Odours, No Staining, No ACM identified
						JHA05 0.2-0.5 PID = 0 ppm	No Odours, No Staining, No ACM identified
		0.50			Borehole JHA05 terminated at 0.5m		Refusal
	1.0						
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 7/9/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JHA06

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 26/05/2017
Logged By: Rohan Hammond
Contractor:
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm): 150

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - CONCRETE slab		
		0.20		Fill	Fill - Gravelly SAND - brown, heterogeneous, damp, poorly graded, angular, medium dense, inclusions of demolition waste, rootlets and wire	JHA06 0.2-0.4 PID = 0 ppm	No Odours, No Staining, No ACM identified
	0.5					JHA06 0.4-0.6 PID = 0 ppm	No Odours, No Staining, No ACM identified
		0.60		CL-ML	Silty CLAY - brown, heterogeneous, damp, firm, angular, dense, inclusions of concrete and brick		
	1.0					JHA06 0.8-1 PID = 0 ppm	No Odours, No Staining, No ACM identified
						JHA06 1-1.2 PID = 0 ppm	No Odours, No Staining, No ACM identified
		1.20			Borehole JHA06 terminated at 1.2m		Refusal
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 7/9/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JHA07

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 26/05/2017
Logged By: Rohan Hammond
Contractor:
Total Hole Depth (mbgs): 1.5
Bore Diameter (mm): 150

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - CONCRETE slab		
		0.15		Fill	Fill - SAND - yellow/ brown, homogeneous, poorly graded, loose, coarse, angular, no inclusions	JHA07 0.2-0.4 PID = 0 ppm	No Odours, No Staining, No ACM identified
	0.5	0.40		Fill	Fill - SAND - brown, heterogeneous, dense, poorly graded, coarse, angular, inclusions of organics and gravels	JHA07 0.4-0.6 PID = 0 ppm	No Odours, No Staining, No ACM identified
	1.0					JHA07 0.8-1 PID = 0 ppm	No Odours, No Staining, No ACM identified
		1.20		CL-ML	Silty CLAY - grey/ yellow with mottles, heterogeneous, saturated, soft, high plasticity, no inclusions	JHA07 1.3-1.5 PID = 0 ppm	No Odours, No Staining, No ACM identified Slight staining and odour, No ACM identified
	1.5	1.50			Borehole JHA07 terminated at 1.5m		
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 7/9/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JHA08

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 114-146 Henry Street and Allen Place Carpark, Penrith

Date: 26/05/2017
Logged By: Rohan Hammond
Contractor:
Total Hole Depth (mbgs): 0.6
Bore Diameter (mm): 150

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Hand Auger				Fill	Fill - CONCRETE slab		
		0.15		Fill	Fill - Gravelly SAND - dark brown, heterogeneous, damp, poorly graded, coarse sands and gravels, medium dense, inclusions of demolition waste, brick, nails, igneous gravels, crushed rock	JHA08 0.2-0.4 PID = 0 ppm	No Odours, No Staining, No ACM identified
	0.5					JHA08 0.4-0.6 PID = 0 ppm	No Odours, No Staining, No ACM identified
		0.60			Borehole JHA08 terminated at 0.6m		Refusal
	1.0						
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BOREHOLE JBSG BOREHOLE.GPJ GINT STD AUSTRALIA.GDT 7/9/17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix O Statistical Analyses

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

	Nonparametric UCL Statistics for Uncensored Full Data Sets	
User Selected Options		
Date/Time of Computation	6/29/2017 11:04:51 AM	
From File	WorkSheet.xls	
Full Precision	OFF	
Confidence Coefficient	95%	
Number of Bootstrap Operations	2000	

B(a)P (Green Spaces)

General Statistics

Total Number of Observations	9	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	0.5	Mean	0.567
Maximum	0.9	Median	0.5
SD	0.141	Std. Error of Mean	0.0471
Coefficient of Variation	0.25	Skewness	2.121
Mean of logged Data	-0.59	SD of logged Data	0.213

Note: Sample size is small (e.g., <10), if data are collected using ISM approach
you may want to use Chebyshev UCL to estimate EPC (ITRC, 2012).
Chebyshev UCL can be computed using the Nonparametric and All UCL Options.

Nonparametric Distribution Free UCL Statistics

Data do not follow a Discernible Distribution (0.05)

Assuming Normal Distribution

95% Normal UCL		**95% UCLs (Adjusted for Skewness)**	
95% Student's-t UCL	0.654	95% Adjusted-CLT UCL (Chen-1995)	0.68
		95% Modified-t UCL (Johnson-1978)	0.66

Nonparametric Distribution Free UCLs

95% CLT UCL	0.644	95% Jackknife UCL	0.654
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	0.708	95% Chebyshev(Mean, Sd) UCL	0.772
97.5% Chebyshev(Mean, Sd) UCL	0.861	99% Chebyshev(Mean, Sd) UCL	1.036

Suggested UCL to Use

95% Student's-t UCL	0.654	or 95% Modified-t UCL	0.66

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Gamma UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	6/29/2017 10:54:49 AM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Lead (Green Spaces)

General Statistics

Total Number of Observations	17	Number of Distinct Observations	14
		Number of Missing Observations	0
Minimum	5	Mean	123
Maximum	910	Median	39
SD	226.8	SD of logged Data	1.525
Coefficient of Variation	1.845	Skewness	3.063

Gamma GOF Test

A-D Test Statistic	0.762	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.792	Data appear Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.216	**Kolmogrov-Smirnoff Gamma GOF Test**
5% K-S Critical Value	0.22	Data appear Gamma Distributed at 5% Significance Level

Data appear Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	0.569	k star (bias corrected MLE)	0.508
Theta hat (MLE)	216.2	Theta star (bias corrected MLE)	242.2
nu hat (MLE)	19.34	nu star (bias corrected)	17.26
MLE Mean (bias corrected)	123	MLE Sd (bias corrected)	172.6
		Approximate Chi Square Value (0.05)	8.856
Adjusted Level of Significance	0.0346	Adjusted Chi Square Value	8.231

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50)	239.6	95% Adjusted Gamma UCL (use when n<50)	257.8

Suggested UCL to Use

95% Adjusted Gamma UCL	257.8

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

	A	B	C	D	E	F	G	H	I	J	K	L
1	**Lognormal UCL Statistics for Uncensored Full Data Sets**											
2												
3	User Selected Options											
4	Date/Time of Computation	6/29/2017 3:04:03 PM										
5	From File	WorkSheet.xls										
6	Full Precision	OFF										
7	Confidence Coefficient	95%										
8	Number of Bootstrap Operations	2000										
9												
10												
11	**Copper (Green Spaces)**											
12												
13	**General Statistics**											
14	Total Number of Observations					16	Number of Distinct Observations					14
15							Number of Missing Observations					0
16	Minimum					5	Mean					43.66
17	Maximum					230	Median					16
18	SD					68.62	Std. Error of Mean					17.16
19	Coefficient of Variation					1.572	Skewness					2.343
20												
21	**Lognormal GOF Test**											
22	Shapiro Wilk Test Statistic					0.898	**Shapiro Wilk Lognormal GOF Test**					
23	5% Shapiro Wilk Critical Value					0.887	Data appear Lognormal at 5% Significance Level					
24	Lilliefors Test Statistic					0.202	**Lilliefors Lognormal GOF Test**					
25	5% Lilliefors Critical Value					0.222	Data appear Lognormal at 5% Significance Level					
26	**Data appear Lognormal at 5% Significance Level**											
27												
28	**Lognormal Statistics**											
29	Minimum of Logged Data					1.609	Mean of logged Data					3.043
30	Maximum of Logged Data					5.438	SD of logged Data					1.123
31												
32	**Assuming Lognormal Distribution**											
33	95% H-UCL					91.23	90% Chebyshev (MVUE) UCL					72.03
34	95% Chebyshev (MVUE) UCL					87.83	97.5% Chebyshev (MVUE) UCL					109.8
35	99% Chebyshev (MVUE) UCL					152.8						
36												
37	**Nonparametric Distribution Free UCLs**											
38	95% CLT UCL					71.88	95% Jackknife UCL					73.74
39	95% Standard Bootstrap UCL					71.86	95% Bootstrap-t UCL					163.7
40	95% Hall's Bootstrap UCL					206.6	95% Percentile Bootstrap UCL					72.98
41	95% BCA Bootstrap UCL					83.46						
42	90% Chebyshev(Mean, Sd) UCL					95.13	95% Chebyshev(Mean, Sd) UCL					118.4
43	97.5% Chebyshev(Mean, Sd) UCL					150.8	99% Chebyshev(Mean, Sd) UCL					214.4
44												
45	**Suggested UCL to Use**											
46	95% Chebyshev (Mean, Sd) UCL					118.4						
47												
48	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
49	These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)											
50	and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.											
51	For additional insight the user may want to consult a statistician.											
52												

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Appendix F Data Gap Investigation 2019

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Penrith City Council

Data Gap Investigation

114 to 146 Henry Street, 42 to 50 Station Street, And Allen Place Car Park

5 March 2019

52372/113024 Rev 3

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Penrith City Council

Data Gap Investigation

114 to 146 Henry Street,
42 to 50 Station Street,
And Allen Place Car Park

5 March 2019

52372/113024 Rev 3

JBS&G

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table of Contents

Abbreviations viii

Executive Summary 1

1. Introduction and Background 3
   - 1.1 Objectives 4
   - 1.2 Scope of Works 4

2. Site Condition and Surrounding Environment 6
   - 2.1 Site Identification 6
   - 2.2 Site Description 6
     - 2.2.1 Shop 3/134-138 Henry Street, Penrith 7
     - 2.2.2 Shop 3/140 Henry Street, Penrith 7
   - 2.3 Surrounding Land Use 7
   - 2.4 Topography 8
   - 2.5 Geology and Soils 8
   - 2.6 Salinity 9
   - 2.7 Hydrology 9
   - 2.8 Hydrogeology 9
   - 2.9 Acid Sulfate Soils 10
   - 2.10 Meteorology 10

3. Site History 12
   - 3.1 EPA Records 12
   - 3.2 Heritage 12
   - 3.3 Review of Council DA / BA Records 12
     - 3.3.1 134-138 Henry Street 12
     - 3.3.2 The Service Station 12
     - 3.3.3 98 to 100 Henry Street 13
     - 3.3.4 121 Henry Street 13
   - 3.4 Summary of Site History 13

4. Previous Environmental Investigations 14
   - 4.1 Preliminary Environmental Site Assessment Report, Geo-Logix (2016) 14
     - 4.1.1 Phase 2 Environmental Site Assessment, JBS&G (2017a) 14
     - 4.1.2 Introduction 14
     - 4.1.3 Intrusive Investigation Activities 15
     - 4.1.4 Results of the Assessment 15
     - 4.1.5 Conclusions 16
   - 4.2 Shop 3 Gaymark Lane, Penrith, NSW – Human Health Risk Assessment, JBS&G (2017b) 17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5. Data Gaps....18
5.1 Chlorinated Ethene Impact Characteristics....18
5.2 The Service Station....18
5.3 Onsite Indoor Air Quality....18
5.4 General Site Characterisation....18
6. Conceptual Site Model....19
6.1 Potential Areas of Environmental Concern....19
6.2 Known Contaminated Media....19
6.3 Potentially Contaminated Media....20
6.3.1 Chlorinated Ethene Impact....20
6.3.2 Former Service Station....20
6.3.3 General Site....21
6.4 Potential for Migration of Contamination from Site....21
6.5 Human / Ecological Receptors and Exposure Pathways....22
6.6 Preferential Pathways....22
6.7 Source to Receptor Pathway Summary....23
7. Sampling and Analysis Plan....25
7.1 Data Quality Objectives....25
7.1.1 State the Problem....25
7.1.2 Identify the Decision....25
7.1.3 Identify Inputs to the Decision....25
7.1.4 Define the Study Boundaries....26
7.1.5 Develop and Decision Rule....26
7.1.6 Specific Limits on Decision Errors....27
7.2 Optimise the Design of Obtaining Data....30
7.3 Soil Investigation Methodology....30
7.4 Groundwater Investigation....31
7.4.1 Groundwater Monitoring Well Installation....31
7.4.2 Well Development and Sampling....31
7.5 Soil Vapour Assessment....32
7.6 Indoor Air Assessment....33
7.7 Decontamination....33
7.8 Duplicate and Triplicate Sample Preparation....34
7.9 Laboratory Analysis....34
8. Assessment Criteria....36
8.1 Regulatory Guidelines....36
8.2 Soil and Soil Vapour Assessment Criteria Selection....36
8.3 Groundwater Assessment Criteria....37

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.4 Indoor Air Criteria 37

9. Quality Assurance / Quality Control 39

9.1 QA/QC Discussion 40

9.1.1 Precision 40

9.1.2 Accuracy 41

9.1.3 Representativeness 42

9.1.4 Comparability 43

9.1.5 Completeness 43

9.1.6 Sensitivity 43

9.1.7 QA/QC Conclusions 43

10. Results 45

10.1 Lithology and Soil Observations 45

10.2 Soil Analytical Results 45

10.2.1 Heavy Metals 45

10.2.2 Polycyclic Aromatic Hydrocarbons 46

10.2.3 Total Recoverable Hydrocarbons 46

10.2.4 Volatile Organic Compounds 47

10.2.5 Total Organic Carbon 47

10.3 Groundwater Field Observations 47

10.4 Groundwater Analytical Results 48

10.4.1 Metals 48

10.4.2 Total Recoverable Hydrocarbons 49

10.4.3 Benzene, Toluene, Ethylbenzene and Xylene 49

10.4.4 Polycyclic Aromatic Hydrocarbons 49

10.4.5 Volatile Organic Compounds 49

10.4.6 Natural Attenuation Parameters 50

10.5 Soil Vapour Field Observations 50

10.6 Soil Vapour Analytical Results 51

10.7 Indoor Air Observations 51

10.8 Indoor Air Analytical Results 52

11. Contaminant Distribution Summary 53

11.1 AEC 1 Former Dry Cleaner 53

11.1.1 Soil Impacts 53

11.1.2 Groundwater Impacts 53

11.1.3 Soil vapour Impacts 53

11.1.4 Indoor Air 54

11.2 AEC 2 Former Service Station 55

11.3 Additional Contamination Issues 56

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

11.3.1 Soil Impacts 56
11.3.2 Groundwater Impacts 56
12. Discussion 57
12.1 Potential Risks to Future Onsite Receptors 57
12.1.1 Soils 57
12.1.2 Groundwater 57
12.1.3 Soil Vapour 57
12.1.4 Indoor Air Assessment 58
12.2 Background Soil Contamination 59
12.3 Chemical Mixtures 59
12.4 Aesthetic Issues 59
12.5 Potential Offsite Migration of Contaminants 59
12.5.1 Groundwater 59
12.5.2 Soil Vapour 60
12.6 Site Management Strategy 60
13. Conclusions and Recommendations 62
14. Limitations 63

List of Tables

Table 2.1 Summary Site Details 6
Table 2.2 Registered Groundwater Bore Search 9
Table 6.1 Areas of Environmental Concern and Contaminants of Potential Concern 19
Table 6.2 Conceptual Site Model Source to Receptor Summary 24
Table 5.1 Summary of Decision Rules 26
Table 5.2 Data Quality Indicators 29
Table 7.3 Analytical Schedule 35
Table 9.1 QA/QC Results Summary 39
Table 10.1 Groundwater Geospatial Characteristics 47
Table 10.2 Groundwater Field Physicochemical Parameters 48
Table 10.3 Groundwater Field Physicochemical Parameters 48
Table 11.1 Indoor Air and Sub-Slab VOC Concentrations 55
Table 11.2 PCE to TCE Ratio in Site Media 55

List of Figures

Figure 1 Site Location
Figure 2 Site Layout & Features
Figure 3 Areas of Environmental Concern & Potential Preferential Pathways

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figure 4A Soil Investigation Locations & Soil Criteria Exceedances
Figure 4B Groundwater Monitoring Well Locations and Groundwater Criteria Exceedances
Figure 4C Soil Vapour Probes and Gas Criteria Exceedances
Figure 4D Floor Plan, Indoor Air and In-Situ Environmental Sampling

Appendices

Appendix A Photographic Log
Appendix B Registered Groundwater Bore Installation Logs
Appendix C EPA Records
Appendix D Australian and NSW Heritage Data Base Searches
Appendix E Site Layout, Council Development Application and Building Application Records
Appendix F Sub-Slab Vapour Probe and Groundwater Monitoring Well Installation Logs
Appendix G Decontamination and Calibration Records
Appendix H Detailed Laboratory Certificates of Analysis and Chain of Custody Documentation
Appendix I Detailed Quality Assurance / Quality Control Data
Appendix J Field Groundwater and Soil Vapour Monitoring Sheets
Appendix K Surveyors Report
Appendix L Meteorological Conditions during Sampling Events
Appendix M Analytical Result Statistical Analyses

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Abbreviations

Term	Definition
°C	Degrees Celsius
ABC	Average Background Concentration
ACL	Added Contaminant Limit
ACM	Asbestos Containing Material
AEC	Area of Environmental Control
AHD	Australian Height Datum
ASS	Acid Sulfate Soils
BGL	Below Ground Level
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
CE	Chlorinated Ethenes
CEC	Cation Exchange Capacity
CLM	Contaminated Land Management
COC	Chain of Command
COPC	Contaminants of Potential Concern
Council	Penrith City Council
CSM	Conceptual Site Model
DEC	Department of Environment and Conservation
DMR	Department of Mineral Resources
DOH	Department of Health
DP	Deposited Plan
DPI	Department of Primary Industries
DQI	Data Quality Indicators
DQO	Data Quality Objectives
DSI	Detailed Site Assessment
EIL	Ecological Investigation Levels
EPA	Environmental Protection Authority
ESA	Environmental Site Assessment
ESL	Ecological Screening Level
HMS	Hazardous Material Survey
HIL	Health Investigation Level
HSL	Health Screening Level
JBS&G	JBS&G Australian Pty Ltd
LCS	Laboratory Control Sample
LEP	Local Environment Plan
LOR	Limit of Reporting
MGA	Map Grid of Australia
NOW	NSW Office of Water
NSW	New South Wales
OCP	Organochlorine Pesticide
OEH	Office of Environment and Heritage
PAH	Polycyclic Aromatic Hydrocarbon
PARCCS	Precision, Accuracy, Representativeness, Comparability, Completeness, Sensitivity
PASS	Potential Acid Sulfate Soil
PCB	Polychlorinated Biphenyls
POEO	Protection of Environment Operations
PSI	Preliminary Site Assessment
QA/QC	Quality Assurance / Quality Control
R2	Low Density Residential
RPD	Relative Percentage Difference
SD	Standard Deviation
TEQ	Toxic Equivalence Quotient
TRH / TPH	Total Recoverable Hydrocarbons / Total Petroleum Hydrocarbon
UCL	Upper Confidence Limit
VOCC	Volatile Organic Chlorinated Compound

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Executive Summary

JBS&G Australia Pty Ltd (JBS&G) was engaged by Penrith City Council (Council, the client) to provide environmental consultancy services associated with the proposed redevelopment of land located at 114 to 146 Henry Street, 42 to 50 Station Street and the Allen Place Car Park, Penrith, NSW (the site). The site comprises ten legal properties and occupies a total area of approximately 1.87 hectares (ha), as shown in **Figure 1** and **2**.

Historical contamination assessments undertaken at the site have identified the potential for risks associated with the former operation of a dry-cleaner, at Shop 3 of 134-138 Henry Street, to current site occupants. In addition, it is understood Council intends on rezoning and divesting the site for redevelopment as part of the proposed Central Park Village. On this basis, data gaps pertaining to the contamination status of the site were identified and addressed through a targeted program of soil, groundwater, soil-vapour and indoor air assessment.

In accordance with the limitations in **Section 14**, the following conclusions are provided:

- Whilst not positively identified as part of this DGI, the potential remains for USTs to be present within the former service station at 118 Henry Street;
- Historical service station operations at 118 Henry Street have not resulted in gross/widespread contamination of site media. Localised, minor contamination hotspots may exist underlying the existing building footprint;
- Historical chlorinated solvent contamination at 134-138 Henry Street has resulted in contamination of site soils, groundwater and soil-vapour at the site;
- Cessation of dry-cleaning operations has resulted in removal of the primary VOC contamination source. Soils nearby to and underlying sewerage infrastructure servicing 134-138 and 140 Henry Street are considered likely to represent an ongoing secondary source of contamination to groundwater and soil-vapour;
- VOC impacted media at the site is localised to the vicinity of the former dry-cleaner. Impacted soil vapour and groundwater are migrating over the northern boundary of the site. The extent of impacted groundwater plume migrating northwest of JBMW05 has not been delineated;
- Results of indoor ambient air sampling undertaken at Shop 3/140 Henry Street have been variable, exceeding the adopted site investigation criterion in one round. On this basis, additional indoor air monitoring is required to determine whether contamination of onsite media represents a risk to current site users;
- An assessment of vapour intrusion potential undertaken within the basement at 121 Henry Street, Penrith has determined that, whilst highly elevated soil-vapour concentrations exist on the boundary of the Council property (Henry Road), no significant vapour intrusion into the basement is occurring;
- With consideration of the proposed general development scenario, potential risks to future site users. On this basis, the site will require remediation prior to, or concurrent with, site redevelopment activities; and
- Based on the results of the completed investigations completed it is considered that the site is able to be made suitable for the proposed future land uses subject to implementation of a RAP.

The following recommendations are provided:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Further groundwater and deep soil vapour assessment works are required the northwest of JBMW05 to provide a boundary to the plume extent.
- An interim EMP should be prepared for the site and should include ongoing monitoring of indoor air at Shop 3/140 Henry Street. In addition, the EMP should guide maintenance/construction activities which have the potential to involve disturbance of soils underlying current hardstands or building footprints and to control potential beneficial use of groundwater; and
- To address potential risks to future site users and potential risks to offsite receptors beyond the northern boundary, an RAP is required to be produced. The RAP should address existing data gaps pertaining to soils underlying existing buildings, offsite soil vapour impacts and the preferred remedial strategy for the site.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1. Introduction and Background

JBS&G Australia Pty Ltd (JBS&G) was engaged by Penrith City Council (Council, the client) to provide environmental consultancy services associated with the proposed redevelopment of land located at 114 to 146 Henry Street, 42 to 50 Station Street and the Allen Place Car Park, Penrith, NSW (the site). The site comprises ten legal properties and occupies a total area of approximately 1.87 hectares (ha), as shown in **Figure 1** and **2**.

It is understood that Council intends on divesting the site for redevelopment as part of the proposed Central Park Village project. The redeveloped site will be utilised for a range of land uses including public recreation parklands, high density residential and commercial/retail. As part of the redevelopment Council requires that the land is rezoned from Commercial Core and Public Recreation to Mixed Use. The proposed future land uses are shown on **Figure 2**.

Previous environmental investigations at the site, documented in Geo-Logix (2016[1]), JBS&G (2017a[2]) and JBS&G (2017b[3]), have reported a range of contamination impacts. A Detailed Site Investigation (DSI) (JBS&G 2017a) concluded that the site was not currently considered suitable for the proposed land uses, but could be made suitable, subject to the implementation of a remedial action plan (RAP). Of primary concern, was a chlorinated ethene (CE) impact associated with a former dry-cleaning operation (Shop 3/134-138 Henry Street). Review of JBS&G (2017a) indicated that offsite migration of media contaminated by CEs is potentially occurring, north of the former dry-cleaner, along the inferred groundwater flow direction.

The reported concentrations of tetrachloroethene (PCE) and trichloroethene (TCE), in groundwater and soil vapour exceeded relevant investigation levels, indicating that there is a potential requirement for the site to be notified to the NSW Environmental Protection Authority (EPA) in accordance with the 'Guidelines on the Duty to Report Contamination Under the *Contaminated Land Management Act 1997 (CLM Act)'*, (NSW EPA 2015[4]).

Council notified the site to the EPA, providing copies of Geo-Logix (2016) and JBS&G (2017a) for review. The EPA determined that regulation of the CE contamination at the site under the CLM Act was not required. The response issued by the EPA indicated that assessment further assessment of the indoor air of premises connected to the former dry-cleaner by sewer should be undertaken.

Council engaged Rebeka Hall (The Auditor), a NSW EPA Auditor (No. 0802) accredited under the *Contaminated Land Management Act 1997* (CLM ACT), of Zoic Environmental Pty Ltd (Zoic) to conduct a review of the existing environmental investigations. The Auditor provided an Interim Advice (IA1), (Zoic 2017[5]), which identified the potential for contamination to exist at the site which has not been completely characterised by investigation works. With respect to the area of the former dry cleaning operations, IA1 reported the following potential contamination issues were not fully characterised:

- The nature and extent of the chlorinated hydrocarbon impact to groundwater and soil vapour, including the potential for offsite migration of contamination;

1 *'Preliminary Site Assessment Report, 134 – 138 Henry Street, Penrith NSW 2750'.* Geo-Logix Pty Ltd, Reference 1601069Rpt01FinalV01_12Aug16, 12 August 2016, Geo-Logix (2016);

2 *'Phase 2 Environmental Site Assessment – 114 to 146 Henry Street, 42 to 50 Station Street and Allen Place Car Park, Penrith, NSW*', JBS&G Australia Pty Ltd, Reference 52372/113034, 9 July 2017, JBS&G (2017);

3 *'Shop 3 Gaymark Lane, NSW, Human Health Risk Assessment'*, JBS&G Australia Pty ltd, Reference 52372-109468 Rev A, June 2017, JBS&G (2017b);

4 *'Duty to Report Contamination Under the Contaminated Land Management Act 1997*'. NSW Environment Protection Authority, September 2015, NSW EPA (2015);

5 *'Interim Advice 1 (IA1) – Review of Existing Information, City Park Precinct, Penrith NSW'*. Zoic Environmental Pty Ltd, Reference 17124 IA01 21Dec17.docx, Zoic (2017);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Impacts to groundwater as a result of historical site uses, including the former operation of a service station located at 118 Henry Street, Penrith, NSW (The Service Station); and
- The risk to occupants of Shop 3 of 140 Henry Street, Penrith, NSW under an ongoing commercial/industrial land use scenario.

This report incorporates a sampling, analysis and quality plan (SAQP) prepared by JBS&G (JBS&G 2018[6]), which documents data gaps that require addressing to allow characterisation of the risks posed and potential requirements for remediation associated with the former dry-cleaning operation. Based on the current use of the site, there were practical constraints on investigation strategies that would fully characterise the potential contamination. As such, Council has adopted a staged assessment strategy, whereby data gaps pertaining to the potential contamination issues which present the most significant financial risks to future developers are the subject of immediate investigation. It is an additional objective of Council to determine the risk to current occupants of buildings within the immediate vicinity of the CE source, under an ongoing commercial/industrial land use.

This report has been prepared concurrently with an assessment of the building basement located at 121 Henry Street, Penrith, NSW. The assessment was conducted to determine whether impacts migrating from the PCPV site potentially represent a risk to basement occupants, and is documented in JBS&G (2019[7])

This report documents the outcomes of the Data Gap Investigation (DGI) undertaken to address the data gaps reported in JBS&G (2018). The DGI has been developed such that it is consistent with the following NSW Environmental Protection Authority (EPA) made or endorsed guidelines: EPA (1995[8]), NEPC (2013[9]), OEH (2011[10]), EPA (2017[11]) and DUAP (1998[12]).

1.1 Objectives

The objective of this DGI is to characterise the following potential contamination issues:

- The nature and extent of impacts to mobile media in the area of the former dry-cleaning operations; and
- The potential risk to current occupants of 134-138 Henry Street and Shop 3/140 Henry Street due to the presence of CEs in soil vapour.

1.2 Scope of Works

The scope of work for this assessment is as follows:

- A review of publicly available site history and background information, as well as existing environmental site investigations, to identify potential areas of environmental concern (AECs) and associated contaminants of potential concern (COPCs);
- Acquisition of additional and/or updated site history and background information, including:

---

6 *Data Gap Investigation Sampling Analysis and Quality Plan – 114 to 146 Henry Street, 42 to 50 Station Street and Allen Place Car Park*. JBS&G Australia Pty Ltd dated 28 March 2018 reference 52372/113024 Rev 0, JBS&G 2018;

7 *Basement Vapour Intrusion Assessment – 121 Henry Street Penrith.* JBS&G Australia Pty Ltd dated 15 January 2019 reference 55702-119862 Rev 0, JBS&G 2019.

8 *'Contaminated Sites: Sampling Design Guidelines.'* NSW Environmental Protection Authority, September 1995, EPA (1995);

9 *'National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013).'* National Environment Protection Council, April 2013, NEPC (2013);

10 *'Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites.'* NSW Office of Environment and Heritage, August 2011, OEH (2011);

11 *'Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme (3rd Edition).'* NSW Environmental Protection Authority, November 2017, EPA (2017);

12 *'Managing Land Contamination, Planning Guidelines, SEPP 55 – Remediation of Land.'* Department of Urban Affairs and Planning. NSW Environment Protection Authority, DUAP (1998);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Historical Development Application (DA)/Building Application (BA) records held or available to Council, accessed under the *Government Information (Public Access) Act 1989* as they relate to Shop 3/134-138 Henry Street and The Service Station;
- Publicly available heritage records held by the Department of Planning and Environment and Council;
- Records of environmental incidents, former environmental licences, or contaminated land notices or notifications, as held by the EPA;
- Licensed groundwater bores present within a 1.5 km radius of the site available on the online NSW Natural Resources Atlas; and

- Review of the environmental setting including a review of topography, geology, hydrogeology and meteorology of the Site and surrounding areas;
- Development and documentation of a conceptual site model (CSM) based on the available information;
- Determination of current data gaps precluding complete characterisation of the potential contamination issues at the site;
- Development and documentation of an SAQP with data quality objectives (DQOs) for the DGI in general accordance with relevant EPA guidelines;
- Execution of a field investigation program comprising sampling of soil, soil-vapour, groundwater and indoor air, at relevant locations across the site;
- Analysis of selected samples for a range of COPCs as identified within the SAQP (JBS&G 2018);
- Comparison of collected data against regulator published / endorsed investigation criteria to facilitate an assessment of land use suitability; and
- Preparation of this DGI report in general accordance with relevant EPA guidelines.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2. Site Condition and Surrounding Environment

2.1 Site Identification

The site location is shown on **Figure 1**. The extent of the site and associated cadastral boundaries are shown on **Figure 2**. The site details are summarised in **Table 2.1** and described in detail in the following sections.

Table 2.1 Summary Site Details

Property Identification and Street Addresses	The site is comprised of the following legal properties: • Lot 1 in DP 545587 – 114 to 116 Henry Street; • Lot 1 in DP113118 – 118 to 120 Henry Street; • Lot 1 in DP 254763 – Henry Street; • Lot 1 in DP 164798 – 134 to 138 Henry Street; • Lot 10 and 11 in DP 553665 – 142 Henry Street; • Lot 2 in DP 556075 – 144 Henry Street; • Lot 3 in DP1200790 – 42 to 44 Station Street; • Lot 1 in DP 526304 – 48 to 50 Station Street; • DP 163176 (No Lot #) – 46 Station Street; In addition, the site area includes the Allen Place Car Park, Gaymark Lane and Allen Place.
Local Government Authority	Penrith City Council
Approximate MGA Coordinates (MGA 56)	As shown on **Figure 2**
Site Zoning	Commercial Core (B3) and Public Recreation (RE1), Penrith (2010[13])
Current Use	Commercial precinct
Previous Use	Commercial precinct and residential, including former dry-cleaning and former petroleum storage/dispensing
Proposed Use	Low density residential
Site Area	Approximately 1.87 ha

2.2 Site Description

The following site description has been adapted from the DSI and updated based on a site inspection undertaken on 8 February 2018. Additional details, pertaining to two shops assessed for indoor air quality, have been included. A photographic log is presented in **Appendix A.**

The site is an irregularly shaped, large commercial precinct bound by the Allen Place loop, Henry Street, Station Street and 98-100 Henry Street. It is comprised of the Allen Place car park and ten commercial premises on the southern side of Henry Street in Penrith. The borders of the site were not secured and open to the public (pedestrians and vehicles). The site was utilised for a range of commercial operations at the time of the site investigation including a car park, retail shops and cafes. High pedestrian and vehicular traffic was observed during working hours.

During the current site assessment period, 8 February to 3 May 2018, all commercial premises at the site were noted to be occupied, including Shop 3/134-138 Henry Street and Shop 3/140 Henry Street.

The site generally sloped downward from east to west, with a slight ridge line observed to dissect the centre of the car park. Inspection of site surfaces and comparisons with the surrounding landscape indicated that significant topographical alterations had not occurred.

Approximately 95 % of the ground surfaces were sealed as asphaltic pavement, concrete pathways, and building footprints with onsite drainage channels directing surface water toward the municipal stormwater system. The balance of the site comprised unsealed grounds in the form of garden beds.

[13] *'Penrith Local Environmental Plan 2011'*, Penrith City Council, 11 August 2017, Penrith (2010);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Buildings at the site did not exhibit significant indicators of dilapidation, although minor wear, consistent with the age of the buildings was observed. A detailed inspection/hazardous building materials survey of the existing site structures was not undertaken as part of this investigation.

No surface water was present at the site at the time of the investigation. No evidence of waste storage, with the exception of commercial municipal waste bins, or storage tanks was observed at the site. No olfactory indicators of volatile chemical usage, as described in the DSI, were encountered during the recent site inspection. No visual indicators of gross or widespread contamination were observed.

Four transformers were observed: one in the southwest and east corners of the Site and two along the northern boundary of the Allen Place Car Park, which were on raised concrete platforms. No hydrocarbon staining was observed to be associated with the transformers. The location of the transformers is shown on **Figure 2.**

2.2.1 Shop 3/134-138 Henry Street, Penrith

The ground floor of 134-138 Henry Street was is divided into three separate shops. The southernmost (Shop 1) was a café, the centre (Shop 2) and northernmost (Shop 3) were retail stores. All three premises are serviced by the same sewerage line, connecting to the broader node (**Figure 4D**).

The former dry cleaner comprised the northern third (Shop 3) of the building located at 134-138 Henry Street, Penrith. The shop-front occupied the majority of the building footprint (>85 %), with the remainder comprising a secluded water closet, storage space and point of sale. The premise was an operational scooter store, occupied by scooters, bikes, helmets and related paraphernalia.

The water closet comprised a small (<3 m^2), fully enclosed space which was serviced by two separate sewerage disposal points. Detergents, household solvents and soaps were observed to be stored within the water closet. The shop-front was serviced by an air exchange (air-conditioning) unit which was observed to be operational during each visit to the premises.

In the alleyway between Shop 3/134-138 Henry Street and Shop 3/140 Henry Street, numerous services were present. Sewerage infrastructure and stormwater pipes ran in a north to south orientation, connecting stormwater and sewerage pipes to the greater system, south of the premises. Services were noted to comprise a mixture of terracotta and polyvinyl chloride pipes.

2.2.2 Shop 3/140 Henry Street, Penrith

The premises comprised the southern half of the building located at 140 Henry Street, Penrith. The shop was partitioned into four rooms and a water closet, joined by a central hallway. The premises housed an alternative health centre at the time of the investigation.

The shop-front rooms were serviced by air exchange units (air conditioners) which were observed to be in operation during each site visit. The water closet comprised a small (<5 m^2), fully enclosed space which was serviced by two separate sewerage disposal points.

An inspection of the property revealed an extensive repertoire of household cleaning and medical products: limescale solvents, surface cleaners, stain removers, methylated spirits, polishes, pest control products, ethanol based surface wipes and carpet deodorizers. In addition, discussion with the current tenants indicated that they often burn incense and candles.

2.3 Surrounding Land Use

The current land uses of adjacent properties or properties across adjacent roads are summarised below.

- North – The site was bound to the north by Henry Street and then numerous commercial premises including Fit'n'Fast Penrith, Queens of Hearts Community Foundation and Nepean College. Further north was an open carpark and commercial premises on Belmore Street,

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

including Bob Jane T-Marts and Veterinary Hospital.

The building located at 121 Henry Street, Penrith comprised a commercial/government office building which was observed to include a multi-level basement carpark;

- East – To the east of the site was Woodriff Street North, followed by by commercial premises and Edwards Place carpark. Further east a Pathology Centre and testing laboratory existed;
- South – The site was bound to the south by Allen Place, following which are multiple commercial properties including cafes, a medical centre and pharmacy. Beyond High Street commercial premises were present; and
- West – The site was bound to the west by Station Street, then medium to high density commercial premises. Further to the west was Peach Tree Creek and eventually the Nepean River.

2.4 Topography

Review of topographic information obtained from the Spatial Information Exchange Viewer, LPI (2015[14]) regional topographic map indicated that the site surfaces have an elevation of approximately 30 m Australian Height Datum (AHD). The site generally sloped downwards to the west, towards the Nepean River.

Site inspection confirmed that the topography on site was not significantly altered from the natural alignment and sloped slightly downward toward the western boundary, Station Street. A local ridge line existed which dissected the Allen Place Car Park in an approximately west to east alignment, with site surfaces sloping downwards perpendicular to the ridge line.

2.5 Geology and Soils

Reference to the 1:100 000 Geological Series Sheet for Penrith, DMR (1991[15]) indicates that the site is underlain by Bringelly Shale of the Wianamatta Group originating from the Middle Triassic epoch. This unit is comprised of shale, carbonaceous claystone, claystone, laminite, fine to medium-grained lithic sandstone, rare coal and tuff. Bringelly Shale is underlain by Ashfield Shale and, at depth, Hawkesbury Sandstone.

Reference to the 1:100 000 Soil Landscape Series Sheet for Penrith, DMR (1990[16]) indicates that the site is within the Richmond Soil Landscape group. This group of landscape is characterised by quaternary terraces of the Nepean and Georges Rivers. Relatively flat (slopes <1 %) and level. Splays, levees provide local relief of <3 m. Formerly a low open woodland. Richmond soils are poorly structured orange to red clay loams, clays and sands. Texture may increase with depth. Ironstone nodules may be present. Plastic clays in drainage lines, red earths and red podzolic soils occur on terrace surfaces with earthy sands on terrace edges. Limitations of the Richmond group include high erosion hazard on terrace edges and minor localised flooding.

The lithology observed during groundwater well installation undertaken as part of the DSI, JBS&G (2017a) was reported as follows:

- Shallow to moderately deep alluvial soils comprising clay to sandy clay (present from a depth of 0.4 m to 10.5 m below ground surface (bgs));
- Moderately deep to deep clay to sandy clay mixed with Nepean River gravels (present from a depth of 6.1 m to 13.0 m bgs); then

[14] *'Spatial Information Exchange Viewer'*, NSW Land and Property Information, Accessed 4 January 2018, https://maps.six.nsw.gov.au/;
[15] *'Penrith 1:100 000 Geological Series Sheet 9030 (Edition 1)'.* Department of Mineral Resources, 1991, DMR (1991);
[16] *'Penrith 1:100 000 Soil Landscape Series Sheet 9030'*. Department of Mineral resources, 1990, DMR (1990);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Residual shale bedrock (present from a depth of 13.0 m to 15.0 m bgs).

2.6 Salinity

Reference to the Department of Infrastructure, Planning and Natural Resources salinity potential map GS912, DIPNR (2002[17]), has indicated that the site exists within an area of 'moderate salinity potential'.

Areas on Wianamatta Group Shales and tertiary Alluvial Terraces. Scattered areas of scalding and indicator vegetation have been noted but no concentrations have been mapped. Saline areas may occur in this zone which have not been identified or may occur if risk factors change adversely. Vegetation at the site observed during the site inspection did not exhibit any indicators of salinity related stress.

2.7 Hydrology

Rainfall is considered likely to migrate primarily through surface water runoff into the municipal stormwater system. Minor infiltration into the underlying porous soils and surface is also expected in areas of unsealed ground.

As discussed in **Section 2.2**, the site is largely covered by concrete, asphaltic pavements and building footprints. As such, surface water generated during periods of rainfall is anticipated to primarily enter the municipal stormwater system; via discharge into onsite stormwater catchment infrastructure or alternatively discharge into stormwater pits within the surrounding roadways.

The nearest water body to the Site is Peach Tree Creek, approximately 1.1 km to the west of the site boundary. Peach Tree Creek ultimately contributes to the Nepean River. Municipal stormwater discharges to the Nepean River.

2.8 Hydrogeology

Registered groundwater bore information was obtained from the NSW Department of Primary Industries groundwater mapping tools, NSW DPI (2016[18]) (**Appendix B**). A review of the registered bore information indicated that there were thirteen bores within a 1.5 km radius of the Site. The registered bore searches are summarised in **Table 2.2**.

Table 2.2 Registered Groundwater Bore Search

Bore ID	Use	Property	Standing Water Level (m bgs)	Well Depth (m)	Encountered Geology Comments
GW026231	Recreation	N/A	-	8.53	Shallow silt and loam clay (4.26 m bgs) to river gravels (4.26-8.53 m bgs)
GW029710	Domestic	N/A	6.00	7.92	Shallow loam (0-2.74 m bgs) to river gravels (2.74-7.92 m bgs)
GW101178	Test Bore	N/A	8.00	11.20	Shallow sandy clay and grey sands (0-6.00 m bgs) to coarse river gravel and cobbles (6.00-10.50 m bgs) overlying residual shale.
GW103048	Recreation	Penrith Showground	6.00	8.00	-
GW108041	Monitoring	Coreen Ave Penrith	6.70	7.50	Shallow clay (0.20-3.30 m bgs) overlying river gravels (3.30-7.50 m bgs)
GW108042	Monitoring	Coreen Ave Penrith	6.40	8.00	Shallow clay (0.20-2.50 m bgs) overlying river gravels (2.50-7.50 m bgs)
GW108043	Monitoring	Coreen Ave Penrith	6.80	9.00	Shallow clayey sands (0.20-5.40 m bgs) overlying river ravels (5.40-9.00 m bgs)

[17] *'Salinity Potential In Western Sydney 2002 – GS912'*. Department of Infrastructure, Planning and Natural Resources, March 2003, DIPNR (2002);

[18] NSW Department of Primary Industries, 2015. Groundwater Monitoring Overview Map. Http://allwaterdata.water.nsw.gov.au/water.stm. Accessed 8 November 2016;

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Bore ID	Use	Property	Standing Water Level (m bgs)	Well Depth (m)	Encountered Geology Comments
GW108044	Monitoring	Coreen Ave Penrith	6.60	9.50	Shallow fill and silty clayey sands (0.00-6.40 m bgs) overlying river gravels (6.40-9.50 m bgs)
GW108484	Recreation	Station St Penrith	-	11.00	Shallow clay (0-6.00 m bgs) to sand (6.00-8.50 mbgs) overlying river gravels (8.50-11.00 m bgs)
GW111987	Monitoring	High St Penrith	-	9.00	Shallow clay (0-3.00 m bgs) overlying river gravels (3.00-9.00 m bgs)
GW111988	Monitoring	High St Penrith	7.50	9.00	Shallow clay (0-3.00 m bgs) overlying river gravels (3.00-9.00 m bgs)
GW111989	Monitoring	High St Penrith	7.50	9.00	Shallow clay (0-3.00 m bgs) overlying river gravels (3.00-9.00 m bgs)

Based on the reported geology, topography and depth to groundwater, groundwater migration is expected to occur in a north-westerly direction, towards Peach Tree Creek approximately 1.2 km away. Groundwater has been reported in the surrounding properties within the river gravels layer. A relatively high-water table (between 5 m and 10 m bgs) is anticipated given the reported levels in the surrounding groundwater wells and the lack of significant variation in topographic levels. The DSI reported groundwater depths ranging from 6.96 m to 8.05 m bgs, flowing in a north-westerly direction.

Registered groundwater bores located within a 1.5 km radius of the site are used for monitoring, recreational and testing purposes. Given the relatively dense urban use of the site and surrounding properties, in addition to the identified licensed bores, there is a moderate probability of additional undocumented monitoring/irrigation bores near the site. No reported utilisation of groundwater as a drinking water source has been reported.

2.9 Acid Sulfate Soils

The Guidelines for the Use of Acid Sulfate Soil Risk Maps, Department of Land and Water Conservation (DLWC) (1997[19]), has indicated that acid sulfate soils (ASS) are likely to be located in coastal lowlands up to about 10 m AHD. No risk map for the area encompassing the site was provided as part of the acid sulfate soil risk map series, DLWC (1998). Review of the geographical and topographical location of the site has indicated that it is a significant distance away from tidal creeks or estuaries, and it is considered unlikely that ASS would exist at the site.

Three Section 149(2&5) planning certificates were obtained for the site, provided in the DSI. The land was not identified to have been affected by a policy adopted by Council or adopted by any other public authority, notified to Council, that restricts the development of the land because of the likelihood of ASS.

No staining, odours or other indicators of ASS were observed during the DSI. No further consideration of the potential presence of ASSs was necessary for the purposes of this investigation.

2.10 Meteorology

A review of average climatic data for the nearest Bureau of Meteorology monitoring location (Penrith Lakes[20]) indicates the site is located within the following meteorological setting:

- Average minimum temperatures vary from 5.5 ^{o}C in July to 18.5 ^{o}C in January;
- Average maximum temperatures vary from 17.7 ^{o}C in July to 30.7 ^{o}C in January;

[19] '*Guidelines for the use of Acid Sulfate Soil Risk Maps, Edition 2*', 1998, Ref: ISBN 0 7347 5134 6, NSW DLWC (1998);

[20] http://www.bom.gov.au/climate/averages/tables/cw_067113.shtml, Commonwealth of Australia, 2013 Bureau of Meteorology, Product IDCJCM0028 prepared on 1 November 2016 and accessed by JBS&G on 8 November 2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- The average annual rainfall is approximately 728.1 mm with rainfall greater than 1 mm occurring on an average of 71.7 days per year; and
- Monthly rainfall varies from 30.6 mm in September to 121.4 mm in June with the wettest periods occurring on average in January to June.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3. Site History

A comprehensive review of the site history is provided in JBS&G (2017a). Readily accessible resources have been reviewed and updates to the site history are provided below. As part of the DGI, additional site history information has been reviewed and pertinent details are provided below.

3.1 EPA Records

A search of the NSW EPA database was undertaken on 12 February 2017 (**Appendix C**) for the site and immediate surroundings. The search consisted of the:

- NSW EPA Protection of the Environment Act public register of licence, applications and notices (maintained under Section 308 of the *Protection of the Environment Operations Act 1997* (POEO Act));
- NSW EPA contaminated land public register of record of notices (under Section 58 of the *Contaminated Land Management Act 1997* (CLM Act)); and
- NSW contaminated sites notified to the EPA (under Section 60 of the CLM Act).

No prevention, clean-up or prohibitions notices and no transfer, variation, suspension, surrender or revocation of an environment protection licences has been issued under the POEO Act for the Site and immediate surroundings.

No notices have been issued under the CLM Act for the Site and immediate surroundings.

Shop 3/134-138 Henry Street is on the list of NSW contaminated sites notified to the EPA, currently classed as 'Under Assessment'.

3.2 Heritage

An updated search of the Australian Heritage Trust database did not reveal any heritage listed items at the site or its immediate surrounds. Heritage information covers Aboriginal as well as European heritage. A search of the NSW Heritage Inventory did not reveal any heritage listed items at the site or immediate surrounds.

Both Australian Heritage Trust and NSW Heritage information are included in **Appendix D**.

3.3 Review of Council DA / BA Records

3.3.1 134-138 Henry Street

Information relating to the operational layout of Shop 3/134-138 Henry Street, included in Geo-logix (2016), is provided in **Appendix E**. An application for sewerage service diagrams servicing Shop 3/134-138 Henry Street was sent to Sydney Water Corporation on 16 January 2018. The sewerage service diagrams are provided in **Appendix E** and shown on **Figure 3.**

Based on this information, it is apparent that the components of the dry-cleaning infrastructure which present the most significant risk for the release of COPCs to the environment were limited to the southern portion of the portion of the building occupied by Shop 3/134-138 Henry Street. Sewerage infrastructure is noted to service the southwest portion of the Shop 3/134-138 Henry Street, directing effluent south to the adjoining mains.

3.3.2 The Service Station

Information relating to the operational layout of The Service Station (118 Henry Street) identified during review of the Council Development Application / Building Application (DA / BA) records, is provided in **Appendix E**. No information existed within the relevant Council records documenting the location of USTs at the former service station. Based on the information provided, bowsers were present on the western and northern portions of the site, indicating that USTs were likely to have been present in these portions of the site.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.3.3 98 to 100 Henry Street

Based on anecdotal information provided by the Site Auditor, a comprehensive review of DA/BA records pertaining to the properties located at 98 to 100 Henry Street were reviewed. Commercial uses of the premises were noted to be limited to retail, health, restaurants, grocery stores and chemists.

Significantly contaminating land uses (such as dry cleaners) were not identified during the period the properties were used for commercial purposes.

3.3.4 121 Henry Street

Inspection of the properties surrounding the PCPV identified a building on the property located at 121 Henry Street, underlain by a basement. Given the proximity of the property to impacted groundwater on the site, DA records were sought from Council to determine whether a risk to current occupants may be present (**Appendix E**).

Plans for the building, submitted with the DA for alterations to the external building structures, including construction of new level 2 office areas, were identified and reviewed. The plans indicate that the building includes a two-level basement with a split level surrounding the building core lifts and services. The basement design indicates that the lower basement level terminates at a depth of approximately 22 m AHD (5 m below Henry Street level) within the southern extent. The first level basement is shown as terminating at approximately 25.5 m AHD (~1.5 m below Henry Street level).Considering measured water levels on the PCPV and the design level for the lower basement slab at 121 henry Street it is considered that groundwater is approximately 1-2 m below the lower level carpark.

3.4 Summary of Site History

The site has been used for a range of uses over its occupied history. Aerial photographs indicate that the site was used primarily for residential housing until the mid-1960s. It underwent staged redevelopment through the 1960s and 1970s until its arrangement was largely in alignment with the current site layout, as observed during the site inspection.

Land title records and aerial photographs indicate that the property located at 118 Henry Street (The Service Station) operated as a service station for a brief period (<10 years) between 1967 and 1977. The site inspection, previous environmental investigations and land title records indicate that the dry cleaner operated from 1977 until late 2017.

Except for the dry cleaner and The Service Station, historical site uses for commercial purposes appear to have been limited to low impact commercial (retail and restaurant) type activities.

No hazardous goods storage licences were identified to have been issued for the site. Based on the range of sources and the general consistency of the historical information, it is considered that the historical assessment has an acceptable level of accuracy with respect to the potentially contaminating activities historically occurring at the site.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4. Previous Environmental Investigations

4.1 Preliminary Environmental Site Assessment Report, Geo-Logix (2016)

Council engaged Geo-Logix Pty Ltd (Geo-Logix) to conduct a preliminary ESA, Geo-Logix (2016) at the property located at 134-138 Henry Street, Penrith, NSW (the preliminary assessment area, Lot 1 DP164798, **Figure 2**). The preliminary assessment was undertaken to assess the potential for contamination to exist at the site given the presence of Shop 3/134-138 Henry Street within the preliminary assessment area.

The preliminary ESA indicated that the site appeared to be vacant until the 1950s. In the period intervening construction of the current building layout and its former vacant use, the site was used for storage of materials. The building layout as observed in the current investigation was constructed during the 1960s and the dry cleaner has operated since 1977. Additionally, aerial photographs provided as part of the report indicated that a service station operated from the 1950s to the 1970s (The Service Station, Lot 1 DP113118, **Figure 2**) which was considered to potentially comprise an off-site contamination source for the preliminary assessment area (134-138 Henry Street). It is noted that the historical service station area forms part of the current investigation area.

Geo-Logix carried out passive soil vapour assessments at two locations within the dry-cleaning shop. Chlorinated ethenes (CEs) PCE, TCE and DCE were detected in soil vapour samples at concentrations in exceedance of the commercial land-use criteria adopted for the assessment. Additionally, benzene, toluene, ethylbenzene and xylene (BTEX) compounds were detected within the soil vapour at concentrations above the laboratory limit of reporting (LOR) but below the commercial land use criteria. Geo-Logix did not identify onsite migration of contaminants from the former service station as a likely source for these BTEX compounds. The preliminary ESA report identified the presence of potential asbestos containing materials (ACM) forming part of the construction of building within the assessment area.

It is JBS&G's experience that soil vapour generated via passive soil vapour measurements are generally unreliable and cannot be supported by sufficient quality assurance/quality control (QA/QC). As such, results from the assessment have not been considered as part of the current investigation.

The site was notified to the EPA by Council following the works undertaken by Geo-Logix. In the period intervening collection of desktop search data for the DSI and the current investigation, the preliminary assessment area was listed on the List of Contaminated Sites Notified to the EPA. An updated copy of the list is provided in **Appendix C**. The EPA provided a response to Council on 12 March 2018, subsequent to review of Geo-Logix (2016) and JBS&G (2017a)

4.1.1 Phase 2 Environmental Site Assessment, JBS&G (2017a)

4.1.2 Introduction

JBS&G was engaged by Council to undertake a DSI at the site. The objective of the DSI was to determine potential for contamination based on current and historical site activities and to draw conclusions regarding the potential contamination status of the site for the proposed land uses, or make recommendations to enable such conclusions to be made. Consideration was given to the potential for contamination to represent unacceptable risks to future site users based on future land uses proposed under the Central Park Village redevelopment.

The assessment comprised a review of Geo-Logix (2016), the site's environmental setting and historical site activities in conjunction with a multi-faceted field investigation. The field program included inspection, sampling and analysis of soil samples from 28 borehole locations, 3 groundwater samples from monitoring well installed as part of the program and 10 soil vapour samples collected from sub-slab soil vapour probes. The sampling locations undertaken as part of

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

the DSI, including exceedances of the relevant criteria are shown on **Figure 4A** to **4C.** JBS&G indicated that the presence of buildings and occupied tenancies during the investigation precluded detailed assessment of all site areas.

The site history assessment indicated that the site has been used for a combination of residential and commercial purposes over the period of available records. Historical land title records, obtained for three of the legal properties, indicated that the premises were owned for residential purposes, prior to light commercial use (retail, service station and funeral home facilities). The site was identified to have undergone numerous redevelopments comprising demolition of former structures. Geo-Logics (2016) was reviewed as part of the site history investigation, which indicated the former dry-cleaning operation was a potential source of contamination.

The desktop assessment identified a range of COPCs associated with the following AECs:

- The dry cleaner (Shop 3/134-138 Henry Street, **Figure 2**): improper disposal of dry cleaning chemicals resultant from the operation of the dry cleaner;
- The Service Station (118 Henry Street, **Figure 2**): improper management of petroleum hydrocarbons associated with the operation of the former service station;
- Whole of Site**:** impacts to potential imported fill materials and disturbed/reworked natural materials:
    - Fill materials of unknown origins observed to be present due to site development activities;
    - Pesticide and herbicide application associated with onsite residential maintenance activities within surficial-moderately deep fill and natural soils;
    - Fuel and oil spills associated with onsite residential maintenance activities; and
    - Hazardous building materials associated with existing and former site structures.

4.1.3 Intrusive Investigation Activities

JBS&G advanced 20 boreholes on a systematic grid and an additional 8 boreholes to target AECs identified as part of the desktop assessment. Selected soil samples were submitted to Eurofins MGT (Eurofins) for laboratory analysis based off characteristics observed during sample collection. COPCs were analysed at the following rates: 35 samples for heavy metals (arsenic (As), cadmium (Cd), chromium (Cr), copper (Cu), lead (Pb), mercury (Hg), nickel (Ni) and zinc (Zn)); 15 samples for volatile organic compounds (VOCs); 20 samples for total recoverable hydrocarbons (TRHs), polycyclic aromatic hydrocarbons (PAHs), phenols and asbestos (500 mL); 24 samples BTEX; and 9 samples for polychlorinated biphenyls (PCBs) and organochlorine pesticides (OCPs).

Three groundwater wells were installed, which were later developed and sampled. The groundwater well installation logs are provided as **Appendix F**. The groundwater samples were analysed for heavy metals, VOCs, TRHs and low-level PAHs.

JBS&G installed 10 sub-slab soil vapour probes surrounding Shop 3/134-138 Henry Street. The sub-slab soil vapour probes were used to access shallow soil vapour. Soil vapour was sampled via active extraction of soil vapours and sorption of VOCs to laboratory prepared carbon tubes. All ten samples were analysed for the presence of VOCs and three samples within the vicinity of the former service station were analysed for TRHs.

4.1.4 Results of the Assessment

Underlying hardstand pavements, fill materials were encountered to depths ranging from 0.2 m and 2.0 m bgs. Fill comprised a combination of silts and clays with varying sand content. Colours were observed to be primarily brown and grey with some orange/yellow clays also encountered. Anthropogenic inclusions were observed within fill material from some locations. Three distinct

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

natural materials were encountered during the investigation: silty/sandy clay which exhibited increasing (although still minor <10 %) sand content with depth (0.2 m – 10.5 m bgs), Nepean River gravels (6.1 m – 13.0 m bgs) and shale bedrock (>11.7 m bgs). No ACM, odours or staining were observed on site surfaces or within the soil profile at any investigation location. No PID readings >1 ppm were reported during field screening for volatile organic compounds during soil sampling.

Sample results from the soil vapour sampling and analyses indicated that CE impacts are present within the vicinity of the dry cleaner. Volatile gas impact extends north of the dry cleaner, along the inferred groundwater flow direction, with exceedances of the soil vapour criteria for PCE and TCE identified from gas samples taken at probe locations SV05 and SV10 (**Figure 4C**). It is noted that the most significant concentrations were detected at location SV05, approximately in line with the inferred groundwater flow direction, and that no exceedances of the site investigation criteria were reported east or south of the dry cleaner.

Contaminants in soils and groundwater were generally not present at concentrations representing statistically significant exceedances of the site assessment criteria with the exception of the following:

- Lead in soil was detected at 930 mg/kg in a sample of fill material from one of the borehole locations. Photographs presented in the DSI indicate that shallow material at this location was impacted by blast furnace slag. This sample was the only sample with statistically significant exceedances of the adopted site criteria, and it is noted that the balance of fill samples analysed were reported to have concentrations below the site investigation criteria. The high concentration of lead in this sample is considered likely to be associated with the observed slag; and
- Concentrations of PCE (0.059 mg/L) and toluene (0.094 mg/L) in groundwater, collected from location PSM01, were present at concentrations exceeding the adopted drinking water criteria, which was considered to represent a potential unacceptable risk to future onsite receptors;

In addition to the above, exceedances of the laboratory LOR for TRHs were reported in groundwater samples from each well, the source for which is unclear. The concentrations were not considered representative of a risk to future onsite/offsite receptors. Additional works are required to determine the source of elevated TRHs.

Groundwater and soil concentrations within the vicinity of the dry cleaner also indicated the presence of CEs, primarily PCE and TCE, albeit at concentrations which were below the adopted site assessment criteria. With respect to the position of the dry cleaner, the inferred groundwater flow direction and the sewer diagrams provided in **Appendix E**, the presence of elevated PCE and TCE within the groundwater sample from PSM01 indicates that CEs may have migrated along the sewerage infrastructure prior to their release into the environment.

4.1.5 Conclusions

JBS&G provided the following conclusions:

- The soil vapour impact underlying, and extending to the north and west of, the dry cleaner represents a potential risk to current and future site users which will require management prior to utilisation of the site for the proposed land uses;
- There is the potential that offsite migration of CEs is occurring via soil vapour and groundwater, along the inferred groundwater flow direction north-northwest of the site boundary;
- Lead impacted fill material will require management prior to use of the site for the proposed land uses. The lead impacted fill material is considered to be limited to soils with slag inclusions.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Additional asbestos may be present within fill materials which were not detected via analytical sampling undertaken as part of the DSI;
- With the exception of the aforementioned, contaminants concentrations in soil and groundwater were generally not representative of significant exceedances of the site assessment criteria, and were not considered to represent a risk to current/future site uses;
- No background soil or aesthetic impacts were identified;
- The site was considered unsuitable for the proposed land uses; however, it was considered that the site could be made suitable for the proposed land uses subject to implementation of a Remedial Action Plan (RAP) which guided the remediation of the identified impacts; and
- The reported concentrations of CEs in groundwater/soil vapour exceed the relevant investigation levels presented in Schedule B1 of NEPC (2013). As a result, there is a potential requirement for the site to be notified to the NSW EPA in accordance with the Guidelines on the *Duty to Report Contamination under the Contaminated Land Management Act 1997,* NSW EPA (2015).

4.2 Shop 3 Gaymark Lane, Penrith, NSW – Human Health Risk Assessment, JBS&G (2017b)

JBS&G was engaged by Council to provide an assessment of the potential human health risk to future commercial occupants of the building described as Shop 3 Gaymark Lane, as located on the southern portion of Shop 3/140 Henry Street. The premises is located within the extent of the site subject to the current investigation.

The Human Health Risk Assessment (HHRA) was considered warranted based upon a review of environmental data provided in JBS&G (2017a), to determine whether soil, groundwater and/or soil vapour impact reported in JBS&G (2017a) posed an unacceptable risk to a proposed future use of the premises for commercial purposes. This has been interpreted as consisting of occupation of the building for commercial activity/durations by adults to assess the risk posed to future occupants of the premises.

The risk assessment considered maximum levels of TCE and PCE recorded in soil vapour in proximity of the premises, and the levels reported adjoining the premises. A sensitivity analysis was undertaken with the risk assessment which has found that the estimated levels of risk were considered suitable conservative to premise decision making in relation to objectives stated.

The levels of sub-surface impact were reported to not pose an unacceptable health risk to potential future commercial users of the site. JBS&G stated that there was no potential for aesthetic impacts through recognition of odours associated with the site impact.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5. Data Gaps

Data gaps identified during review of the existing environmental investigations are presented in **Section 5.1** to **Section 5.4** below. The data gaps have formed the basis of the scope of work undertaken in this assessment.

5.1 Chlorinated Ethene Impact Characteristics

Historical investigation works have identified a CE impact to soil, groundwater and soil vapour in the vicinity of the dry cleaner. Results presented in the DSI have indicated that the CE impact may be migrating west of the dry cleaner and off-site via the northern boundary, within mobile media (groundwater and soil-vapour). In addition, CEs may have migrated through/along the sewerage infrastructure shown on **Figure 3.**

No sampling has occurred to date along/across the northern boundary of the site to assess the potential for offsite migration of mobile media. No groundwater or soil vapour sampling has been undertaken west of historical sample locations identified to be significantly impacted (SV05 and PSM01). In addition, delineation of the extent of CE impacts to soil identified in fill/natural soils collected from JHA04 (**Figure 4A**) has not been undertaken.

5.2 The Service Station

Operation of The Service Station located at 118 Henry Street may have resulted in impacts to soil, groundwater and soil-vapour which have not yet been characterised. Additional groundwater characterisation activities are required to be undertaken downgradient of The Service Station to determine if contamination of the groundwater has occurred as a result of The Service Station's operation.

DA design documentation associated with the former service station has been provided in **Appendix E**. It is noted that a review of Council DA documentation did not provide any indication of the location of former/current underground petroleum storage systems.

5.3 Onsite Indoor Air Quality

The soil vapour assessment undertaken as part of JBS&G (2017a) included a single soil vapour sampling event. Given the presence of elevated contaminant concentrations in soil-vapour, The Auditor requested that additional sampling events be considered to characterise soil vapour concentrations. Soil vapour sampling events are used as the basis to inform potential levels of volatile constituents in indoor air, and in lieu of being able to undertake additional soil vapour measurements, an assessment instead can be undertaken of indoor air.

No indoor air sampling has been undertaken. Given the absence of indoor air sampling data, and the potential limited extent of the soil vapour locations able to be assessed, it is not possible to clearly define potential risks in onsite buildings within the vicinity of the CE impact.

5.4 General Site Characterisation

Broad scale characterisation activities undertaken at the site have been limited due to the presence of extensive building footprints and the current occupational status of the site.

Additional groundwater assessment activities are required to determine the groundwater flow direction and potential impacts associated with the former site uses (the dry cleaner and The Service Station) identified during the desktop phase of the DSI. In addition, the source of elevated TRHs in groundwater identified during the DSI is not currently known.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6. Conceptual Site Model

6.1 Potential Areas of Environmental Concern

Based on the site history review and observations of site conditions during the detailed site inspection, AECs and associated COPCs have been identified and are presented in **Table 6.1**.

Table 6.1 Areas of Environmental Concern and Contaminants of Potential Concern

Area of Environmental Concern (AEC)	Contaminants of Potential Concern (COPC)
AEC 1 Former Dry Cleaner and CE Plume 134-138 Henry Street (Lot 1 DP164798, **Figure 2**) Improper disposal/management of dry-cleaning chemicals resultant from the operation of the dry-cleaner	Chlorinated ethenes (PCE, TCE and cis-1,2 DCE) and TRHs
AEC 2 Former Service Station 118 Henry Street (Lot 1 DP113118, **Figure 2**) Improper management of petroleum hydrocarbons associated with the former service station	TRHs, BTEX and lead
AEC 3 Transformers Allen Place Car Park (**Figure 2**) Past spillage and/or leakage of transformer oils	TRHs and PCBs
AEC 4 Lead Impacted Fill Material 42 Station Street (Lot 3 DP1200790, **Figure 2**) Previously identified lead impacted fill material in the location of JHA02	Lead
AEC 5 Fill Materials and Shallow Soils Underlying Building Footprints All areas in which site development activities resulted in the application of fill materials to create current site levels. Application of COPCs as a result of general maintenance and operation of residential/commercial premises through the period of site occupation (pesticides, herbicides, fuel and oil spills, etc.)	Heavy metals, PAHs, TRHs / BTEX, OCPs, PCB, VOCs and asbestos.

6.2 Known Contaminated Media

As discussed in **Section 4.2**, results from Geo-Logix (2016) and JBS&G (2017a) indicated that several contamination impacts are present at the site.

CE impact exists within the vicinity of the former dry-cleaner. The impact has been detected in samples of soil vapour collected to the west and north of the dry cleaner, with PCE and TCE detected at concentrations representing a potential risk to human health in samples collected from probes SV05 and SV10 (**Figure 4C**). Review of analytical data presented in JBS&G (2017a) has provided evidence that the CE impact does not extend south or east of the dry cleaner at concentrations exceeding the site investigation criteria. However, as discussed in **Section 5.1**, there is the potential for CEs to have migrated along the sewerage service infrastructure southwest of the dry cleaner.

Low levels of CEs were detected in soil samples taken from JHA04, within close vicinity to the dry cleaner sewerage infrastructure (**Appendix E**), and CEs were detected in groundwater at PSM01. Detections of CEs in soil and groundwater west and south of the dry-cleaner has demonstrated that lateral and vertical migration of the CEs has occurred.

Soil impacts were not identified that represent risks to future site users. PCE and toluene in groundwater, collected from PSM01, were present at concentrations exceeding the adopted drinking water criteria, which was considered to represent a potential unacceptable risk to future onsite receptors. No other exceedances of the groundwater criteria were reported.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.3 Potentially Contaminated Media

In addition to the known contaminated media discussed in **Section 6.2**, each of the remaining AECs and corresponding COPCs identified in **Table 6.1** have the potential to result in impact to soil and, except for asbestos, to groundwater.

Based on information presented in JBS&G (2017), a single unconsolidated aquifer has been identified at the site which has the potential to be impacted by site contamination. The aquifer of concern exists within the soil lithological unit (which is inclusive of the layer of clay mixed with river gravels and overlying clay absent river gravels) underlain by shale bedrock. All references to groundwater made in the DGI refer to this single aquifer.

6.3.1 Chlorinated Ethene Impact

The extent of the CE impact identified near the dry cleaner has not been fully defined by historical investigations. Review of the sewerage layout plans (**Appendix E**) has indicated that the most significant contamination may potentially be present along the western portion of 134-138 Henry Street.

PCE, TCE and DCE are volatile contaminants and have the potential to result in soil vapour impacts a significant distance from the source of the impact. Previous results have indicated that the contaminants have migrated vertically (as indicated by groundwater impact at PSM01) and laterally (as indicated by historical soil vapour results surrounding the property) from the source of the impact.

Soil vapour to the west of SV10 and to the north of SV05 are considered potentially impacted media based on historical sample results. In addition, given the evidence that CEs have migrated along the sewerage infrastructure, soil vapour along the alignment of the sewerage infrastructure is considered to be potentially impacted. Where groundwater has been impacted by CEs, there remains the potential for deep soil-vapour to be impacted as a result.

Soils in areas within close vicinity to the sewerage infrastructure, as indicated by low level CEs at location JHA04, and/or underlying the impact source may also be impacted.

The extent of CE impact to groundwater underlying and downgradient of the impact source is currently unknown. Given the nature of the contaminants and mobility of the media they have currently been detected within, it is possible that significant impacts to groundwater underlying and downgradient of the dry cleaner exist which have not been identified by previous investigations.

It is noted that land use near the source zone is restricted to commercial occupation. The surrounding properties on the southern side of Henry Street consist of enclosed buildings constructed at-grade. Indoor air within the commercial buildings is also a potentially impacted medium. It is noted that the building located at 121 Henry Street, north of the site, includes a multilevel basement approximately 20 m north of 134-138 Henry Street.

6.3.2 Former Service Station

The presence of former UPSS infrastructure, as may have been present during commercial operation of the service station, is not currently known. Given the absence of documentation pertaining to the UPSSs at the service station, or limited soil/groundwater analytical data within the premises, soil and groundwater in the vicinity of the service station are considered to be potentially impacted media.

Where significant impacts due to tank leakage/ruptures are present, underlying soils at depth and groundwater impacts may be present. Impacts to groundwater, if present, are considered likely to have migrated to the west / north-west, in line with the inferred groundwater flow direction.

Soil vapour analytical results indicated a minor detection of TRH at location SV04 (**Figure 4C,** west of the former service station) and all other soil-vapour analytical results surrounding the former service station (west and south of the service station) were below the laboratory LOR. Given the absence of

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

significant soil vapour concentrations for TRH within samples taken from the vicinity of The Service Station, it is considered unlikely that a significant impact to soil vapour is present as a result of former, undocumented USTs or hydrocarbon spills.

6.3.3 General Site

Soil analytical results generally demonstrated that fill material and shallow natural soils were free from impacts. As documented in **Section 5**, areas underlying current building footprints and concrete hardstands have not been the subject of detailed assessment. Historical site usage and redevelopment activities may have resulted in impacts to shallow soils.

Within the vicinity of the transformers currently present at the site, there is the potential for historical leakage/spillages of transformer oils. Impacts, where present, associated with the transformers are considered likely to be constrained to surface and/or near surface soils and are considered unlikely to have migrated to the reported depth of groundwater (6-8 m bgs).

Where fill materials are present, natural soils have been disturbed, or waste material buried, there is a potential for impacts at depth, consistent with the depth of disturbance. Anthropogenic materials are commonly present in impacted fill/disturbed soil and can be used as an indication of the depth of disturbance. Where fill materials impacted with chemical based contaminants are identified, there is a potential the impact may have migrated laterally and vertically below the fill material into the natural soil profile and/or underlying groundwater.

On the basis of the above, natural soils at depth, soil vapour and groundwater in areas underlying current building footprints at the site are considered potentially impacted media as a result of historical site activities. The extent of the potential impact to natural soils will be dependent upon the size and severity of the overlying impact as well as the properties of the natural soils and groundwater conditions.

6.4 Potential for Migration of Contamination from Site

Contaminants generally migrate from site via a combination of windblown dusts, rainwater infiltration, groundwater migration and surface water runoff. The potential for contaminants to migrate is a combination of:

- The nature of the contaminants (solid/liquid and mobility characteristics);
- The extent of the contaminants (isolated or widespread);
- The location of the contaminants (surface soils or at depth); and
- The site topography, geology, hydrology and hydrogeology.

The COPCs identified as part of the site history review and site inspection are generally in solid (e.g. asbestos, PAHs and metals), liquid (e.g. TPH, BTEX, OCPs and PCBs) or gaseous (e.g. BTEX, Volatile TRH, semi-volatile PAHs) form.

Review of analytical data presented in JBS&G (2017a) has indicated that offsite migration of CE impacted media (soil vapour and groundwater) may be occurring along the northern boundary of the site.

Where significant impacts due to tank leakage/ruptures are present as a result of improper management of hydrocarbon fuels at The Service Station, impacts to soils at depth and groundwater may be present. Impacts to groundwater, if present, are considered likely to have migrated to the west / north-west, in line with the inferred groundwater flow direction.

The ground surfaces surrounding the remaining AECs are comprised of a mixture of sealed pavements and building footprints. The extent of surface water infiltration into the subsurface within the vicinity of the remaining AECs is therefore considered to be limited. The solubility of chemical contaminants in soil, in addition to rate of surface water intrusion, perched water seepage

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

and groundwater movement across the site will influence the potential for migration of soil and groundwater based contamination within and from the site. Except for the dry cleaner and service station, where localised impacts to soil are/may be present, these are considered not likely to be present at an extent which would result in migration of contamination at a scale where off-site migration would require to be addressed.

Whilst hardstand pavements and building footprints are maintained at the site, the potential for migration via surface water runoff and windblown dust is low.

6.5 Human / Ecological Receptors and Exposure Pathways

Potential human receptors of environmental impact include future residents, visitors and construction/maintenance contractors engaged to work at the site, who may potentially be exposed to COPCs through inhalation or direct contact with impacted soils, groundwater or soil-vapour present within the site. Additionally, migration of contaminants via infiltration into the groundwater and migration of contaminated soil-vapour also poses a risk to sensitive human receptors.

Should redevelopment of the site occur, potential human receptors may in the future include:

- Potential dermal contact with and ingestion of impacted soils/groundwater as present at shallow depths and/or accessible by future excavations by site workers and/or occupants; and
- Potential Inhalation of vapours migrating upwards and laterally from fill and/or natural soil.

The site is primarily covered by hardstand pavements and building footprints, however several of the identified AECs have the potential to impact onsite ecological receptors. Possible off-site ecological receptors are limited to potential impacts associated with groundwater and soil-vapour migrating from the site.

Current and future human receptors on the site could be potentially exposed to soil contaminants by oral, dermal and inhalation pathways. Direct contact pathways (oral and dermal) will only be relevant for near surface soils for most site users. However, potential construction and future intrusive/excavation worker exposures could occur for deeper soils.

The reported fluid electrical conductivity (JBS&G 2017) indicate that the water present within all monitoring wells at the site is not suitable for drinking and is unsuitable for most types of irrigation. In addition, no registered groundwater bores have been identified as being used for the extraction of drinking water and given the urbanised nature of the site, it is not expected that water within the aquifer is or will be utilised by for the purposes of drinking water or associated uses (such as swimming pool filling). Inhalation pathways are relevant where asbestos, volatile or semi-volatile COPCs are present. Occupants of the buildings surrounding the identified CE impacts are potentially receptors due to migration of soil vapour.

6.6 Preferential Pathways

For the purpose of this assessment, preferential pathways have been identified as natural and/or man-made pathways that result in the preferential migration of COPC as either liquids or gasses.

Review of the sewerage design layout plans (**Appendix E**) has identified a potential a preferential pathway abutting the western boundary of the former dry-cleaner. The preferential pathway is shown on **Figure 3**. The preferential pathway is considered likely to have facilitated transport of CEs from the dry cleaner.

Man-made preferential pathways are likely present throughout the site, generally associated with areas of previously disturbed fill material and service easements.

Natural preferential pathways are likely limited to natural lithological borders, such as between porous soils and bedrock, where infiltrating groundwater is vertically confined and begins to migrate laterally.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.7 Source to Receptor Pathway Summary

Table 6.2 below presents a summary of potential source to receptor pathways identified in **Section 6.1** to **6.6.**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 6.2 Conceptual Site Model Source to Receptor Summary

Areas of Environmental Concern	Contaminant of Potential Concern / Media	Pathway -> Uptake	Receptor
The Former Dry Cleaner	Chlorinated Ethenes / Soil-vapour	Advection into Buildings and/or Open Atmosphere Environments -> Inhalation	Current and future construction/maintenance workers and/or occupants of the site and downgradient areas
		Offsite Migration via Preferential Pathways then Advection into Buildings and/or Open Atmosphere -> Inhalation	Current and future construction/maintenance workers and/or occupants of the site
	Chlorinated Ethenes / Soil and Groundwater	Physical Contact -> Oral or Dermal Ingestion	Current and future construction/maintenance workers and/or occupants of the site
		Offsite Migration via Groundwater -> Oral/Dermal Contact, Inhalation or Biological Uptake	Downstream ecological receptors (Peach Tree Creek) Current and future recreational users and construction/maintenance staff at Peach Tree Creek
The Former Service Station	TRH and BTEX / Soil-vapour	Advection into Buildings and/or Open Atmosphere Environments -> Inhalation	Current and future construction/maintenance workers and/or occupants of the site
		Offsite Migration via Preferential Pathways then Advection into Buildings and/or Open Atmosphere -> Inhalation	Current and future construction/maintenance workers and/or occupants of the site
	TRH, BTEX / Groundwater	Disturbance/Physical Contact -> Oral or Dermal Ingestion	Current and future construction/maintenance workers and/or occupants of the site
		Offsite Migration via Groundwater -> Oral/Dermal Contact, Inhalation or Biological Uptake	Downstream ecological receptors (Peach Tree Creek) Current and future recreational users and construction/maintenance staff at Peach Tree Creek
	Heavy Metals / Soil and Groundwater	Disturbance/Physical Contact -> Oral or Dermal Ingestion	Current and future construction/maintenance workers and/or occupants of the site
		Offsite Migration via Groundwater -> Oral/Dermal Contact, Inhalation or Biological Uptake	Downstream ecological receptors (Peach Tree Creek) Current and future recreational users and construction/maintenance staff at Peach Tree Creek
Fill Materials and Shallow Surface Soils	Heavy Metals / Soil and Groundwater	Disturbance/Physical Contact -> Oral or Dermal Ingestion	Current and future construction/maintenance workers and/or occupants of the site
		Offsite Migration via Groundwater -> Oral/Dermal Contact, Inhalation or Biological Uptake	Downstream ecological receptors (Peach Tree Creek) Current and future recreational users and construction/maintenance staff at Peach Tree Creek
	Asbestos / Soil and Material	Disturbance -> Inhalation	Current and future construction/maintenance workers and/or occupants of the site
	TRH, PAH, BTEX, OCPs, OPPs and PCBs / Soil and Groundwater	Disturbance/Physical Contact -> Oral or Dermal Ingestion	Current and future construction/maintenance workers and/or occupants of the site
		Offsite Migration via Groundwater -> Oral/Dermal Contact, Inhalation or Biological Uptake	Downstream ecological receptors (Peach Tree Creek) Current and future recreational users and construction/maintenance staff at Peach Tree Creek

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7. Sampling and Analysis Plan

7.1 Data Quality Objectives

DQOs for the investigation have been developed in accordance with the process outlined in Appendix B of the NEPM, NEPC (2013), and are discussed in the following sections.

7.1.1 State the Problem

As discussed in **Section 1**, Council intends on divesting the site for the purpose of redevelopment as part of the proposed Central Park Village. Additional investigation works are required to determine the severity and extent of impacts at the site to inform Council and potential developers of the nature of contamination at the site. As such, the following data gaps have been identified as being required to be addressed as part of this DGI:

- **AEC 1:** the nature and extent of impacted mobile media (groundwater and soil-vapour) as a result of contamination from the operation of the dry cleaner located at 134-138 Henry Street (**Figure 2**), including indoor air quality within onsite buildings surrounding the impact source (**Figure 6**); and
- **AEC 2:** the potential for groundwater impact as a result of the operation of The Service Station at the site.

7.1.2 Identify the Decision

The decisions below are generally based on the EPA (2017):

- Are there any unacceptable risks to likely future onsite receptors?
- Are there any impacts of chemical mixtures?
- Are there any aesthetic issues at the site?
- Is there any evidence of, or potential for, migration of contaminants from the site?

7.1.3 Identify Inputs to the Decision

Inputs identified to provide sufficient data to make the decisions nominated above include:

- Desktop review;
- Detailed site inspection/walkover;
- Physical observations and interpretation of potentially contaminated media through the collection of soil, groundwater and soil vapour samples;
- Development of appropriate assessment criteria for evaluation of potential soil, groundwater and soil-vapour impacts;
- Field parameters as measured utilising calibrated equipment during the intrusive investigation including assessment of soil sample headspace, groundwater physicochemical characteristics and soil-vapour characteristics;
- Laboratory analysis of selected samples of potentially contaminated media for COPCs; and
- Confirmation that data generated by sample analysis are of an acceptable quality to allow reliable comparison to assessment criteria by assessment of quality assurance / quality control (QA/QC) as per the data quality indicators established in **Section 7.1.6**.

Specifically, sufficient data needed to be collected from each of the potentially impacted media identified in AEC 1 and AEC 2 for the associated COPC (**Table 6.1**).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.1.4 Define the Study Boundaries

The study boundaries were generally limited to the cadastral boundaries of the site. Three sampling points were installed within Henry Street, 2 m to 15 m north of the site boundary (**Figure 4B** to **4D**). The site area and approximate Map Grid of Australia (MGA) boundary points are shown on **Figure 2.** The vertical extent of the investigation was limited to the base of the deepest borehole (JBMW03) at 12.1 m bgs.

As discussed in **Section 7.3.1.3**, acquisition of necessary vapour data is dependent upon atmospheric conditions, it was anticipated that appropriate atmospheric conditions would arise in the period between March and April 2018. The remainder of the field investigation program was also anticipated to be completed during this period.

Whilst it is understood that several data gaps pertaining to the characterisation of potential contamination exist, site access constraints due to the presence of large occupied structures currently prevent detailed assessment of all the identified AECs. Council has communicated to JBS&G that, in *lieu* of full site characterisation, the items most consequential to redevelopment strategies are the foremost concern.

7.1.5 Develop and Decision Rule

Laboratory analytical data was assessed against the appropriate criteria as identified in **Section 6**. Statistical analyses of soil data was undertaken, where appropriate, in accordance with relevant guidance documents. The following statistical criteria was utilised:

- The 95 % Upper Confidence Limit (UCL) on the average concentration for each analyte (calculated for samples collected from consistent soil horizons, stratigraphy or material types) must be below the adopted criterion;
- No single analyte concentration shall exceed 250 % of the adopted criterion; and
- The standard deviation of the results must be less than 50 % of the criterion.

The decision rules adopted to answer the decisions identified in **Section 7.1.2** are summarised in **Table 7.1**.

Table 7.1 Summary of Decision Rules

Decisions Required to be Made	Decision Rule
1. Are there any unacceptable risks to onsite future receptors?	A) Soil analytical data was compared against EPA endorsed criteria. Statistical analysis of the soil data was completed in accordance with relevant guidance documents, as appropriate, to facilitate the decisions. The criteria in **Section 6.2**, and the following statistical criteria were adopted with respect to soils: Either: the reported concentrations are all below the site criteria; Or: the average site concentration for each analyte is below the adopted site criterion; no single analyte concentration exceeded 250 % of the adopted site criterion; and the standard deviation of the results is less than 50 % of the site criterion; And: the 95 % UCL of the average concentration for each analyte is below the adopted site criterion. If the statistical criteria stated above were satisfied, the answer to the decision is No. If the statistical criteria are not satisfied, the answer to the decision is Yes.
	B) Groundwater analytical data was compared against EPA endorsed criteria. If the reported concentrations are all below the site criteria, the answer to the decision is No; If analytical concentrations are in excess of the site criteria, further consideration of potential risks would be required to establish whether the results are representative of a risk to future site users. If this was not the case, then the answer to the decision is Yes
	C) Vapour analytical data was compared against EPA endorsed Tier 1 criteria. If the reported concentrations are all below the adopted Site Criteria, the answer to the decision is No; If analytical concentrations were in excess of the site criteria for one or more

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Decisions Required to be Made	Decision Rule
	samples, the answer to the decision is Yes. Alternatively, consideration may be given to proceeding to a Tier II site specific assessment to further evaluate the potential risks.
	D) Indoor air analytical data was compared against EPA endorsed Tier 1 criteria. If the reported concentrations are all below the adopted Site Criteria, the answer to the decision is No; If analytical concentrations were in excess of the site criteria for one or more samples, the answer to the decision is Yes. Alternatively, consideration may be given to proceeding to a Tier II site specific assessment to further evaluate the potential risks.
3. Are there any contaminant odours, or other unacceptable aesthetic concerns?	If there are any unacceptable odours, or the presence of asbestos fragments or similar, the answer to the decision is Yes. Otherwise, the answer to the decision is No.
4. Is there any evidence of, or potential for, migration of contaminants from the site at levels which represent unacceptable risks to offsite receptors?	Assessment of the potential for groundwater impact at the site included installation of three new groundwater monitoring wells at the site and four new well outside of the site, across the northern boundary. The five new (JBMW01 to JBMW07) and three existing monitoring wells (PSM01 to PSM03) were sampled and the resulting groundwater contaminants concentrations compared against adopted assessment criteria. Assessment of the potential for soil vapour impact at the site included installation and sampling/analysis of additional 7 sub-slab soil vapour probes and 2 deep soil vapour monitoring wells. Three of the sub-slab probes were installed along the northern boundary, and three along the sewer service infrastructure, west of the dry cleaner. The resulting concentrations were compared against adopted EPA based criteria. Based on assessment results, is there any evidence of, or the potential for, unacceptable contaminant concentrations to migrate from the site? If yes, the answer to the decisions is Yes. Otherwise, the answer to the decision is No.

7.1.6 Specific Limits on Decision Errors

This step was to establish the decision maker's tolerable limits on decision errors, which are used to establish performance goals for limiting uncertainty in the data. Data generated during this project must be appropriate to allow decisions to be made with confidence.

Section 2.4 of *Contaminated Sites: Sampling Design Guidelines,* EPA (1995[21]), indicates that a site investigator should maintain a confidence level no lower than 95 %. As such, for the assessment of soil samples, the 95 % upper confidence limit for contaminant concentrations was compared to the adopted site assessment guidelines where required, providing the statistical criteria in **Table 5.1** are met.

Specific limits for this project were adopted in accordance with the appropriate guidance from the NSW EPA National Environmental Protection Measure (NEPM), NEPC (2013), appropriate Data Quality Indicators (DQIs, used to assess quality assurance / quality control) and standard JBS&G procedures for field sampling and handling.

To assess the usability of the data prior to making decisions, the data was assessed against pre-determined DQIs for to precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS) parameters. The acceptable limit on decision error is 95 % compliance with DQIs.

The pre-determined DQIs established for the project are discussed below in relation to the PARCCS parameters, and are shown in **Table 5.2**.

[21] *'Contaminated Site: Sample Design Guidelines'*, NSW Environment Protection Authority, ISBN 0 7310 3746 1, September 1995, EPA (1995)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- **Precision** – measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples.
- **Accuracy** – measures the bias in a measurement system. The accuracy of the laboratory data that are generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- **Representativeness** – expresses the degree which sample data accurately and precisely represent a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
- **Comparability** – expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; and ensuring analysing laboratories use consistent analysis techniques; and reporting methods.
- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.
- **Sensitivity** – expresses the appropriateness of the chosen field and laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted site assessment criteria.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 5.2 Data Quality Indicators

Data Quality Objectives	Frequency	Data Quality Indicators
Precision		
Split duplicates (intra laboratory) [3,4,5]	1 / 20 samples	<50 % Relative Percent Difference (RPD[1])
Blind duplicates (inter laboratory) [3,4,5]	1 / 20 samples	<50 % RPD[1]
Laboratory Duplicates	1 / 20 samples	<50 % RPD[1]
Accuracy		
Surrogate spikes [3]	All organic samples	70-130 %
Laboratory control samples [3]	1 per lab batch	70-130 %
Matrix spikes [3]	1 per lab batch	70-130 %
Representativeness		
Sampling appropriate for media and analytes	All samples	-[2]
Samples extracted and analysed within holding times.	-	organics (14 days), inorganics (6 months)
Laboratory Blanks [3]	1 per lab batch	<LOR
Trip spike [3]	1 per lab batch	70-130 % recovery
Storage blank [3]	1 per lab batch	<LOR
Rinsate sample [3]	1 per sampling event/media	<LOR
Carbon tube breakthrough control samples[4]	1 per primary sample	<LOR
Method Blank [4]	1 per sampling event	<LOR (carbon tubes)
Background Sample [5]	1 per site	< Criteria
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All Samples
Standard analytical methods used for all analyses	All Samples	NATA accreditation
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples[2]
Limits of reporting appropriate and consistent	All Samples	All samples[2]
Completeness		
Sample description and COCs completed and appropriate	All Samples	All samples[2]
Appropriate documentation	All Samples	All samples[2]
Satisfactory frequency and result for QC samples		95 % compliance
Data from critical samples is considered valid	-	Critical samples valid
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted Site assessment criteria	All samples	LOR ≤ site assessment criteria

[1] If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgment will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.
[2] A qualitative assessment of compliance with standard procedures and appropriate sample collection methods will be completed during the DQI compliance assessment.
[3] For soil and groundwater samples
[4] For soil vapour samples
[5] For indoor air samples

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.2 Optimise the Design of Obtaining Data

Various strategies for developing a statistically based sampling plan are identified in *Contaminated Sites: Sampling Design Guidelines,* EPA (1995[22]), including judgemental, random, systematic and stratified sampling patterns. The adopted sampling methodology is discussed in the following sections.

Based on the identified AECs and associated potentially impacted media, a judgemental sampling plan has been developed such that sufficient characterisation data was collected to address each of AEC 1 and AEC 2 (**Table 6.1**).

The sampling protocol comprised the following:

- Installation, development, sampling and analysis of seven new groundwater monitoring wells to the east, north, west and southwest of 134-138 Henry Street. It is noted that the northeast well was installed immediately northwest of the former service station;
- Soil inspection, sampling and analysis of excess soils generated during the installation of the new monitoring wells;
- Re-development and sampling of the three existing groundwater monitoring wells (PSM01 to PSM03);
- Installation, development, sampling and analysis of 7 new sub-slab soil vapour probes and two deep soil vapour wells; and
- Four separate indoor air sampling events within 134-138 Henry Street and Shop 3/140 Henry Street.

The sampling and analysis program is summarised in **Table 7.3**. Sampling locations are shown on **Figure 3**.

7.3 Soil Investigation Methodology

Soil sampling was completed at five borehole locations, which were converted to monitoring wells JBMW01to JBMW05 (**Figure 4A** and **4B**)**.** Soil sampling was completed via a combination of manual and mechanical excavation using hand auger, push tube and solid flight auger drilling methods. Soil samples were collected from the soil immediately underlying hardstand pavements, and then 0.5 m to 1 m intervals to the top of shale bedrock (11.5 m to 12 m bgs).

During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indicators of contamination were noted where observed. A calibrated PID fitted with a 10.6 eV lamp was utilised to screen for VOCs within the material sampled from JBMW01 to JBMW04, to assist in selection of soil samples for laboratory analysis. Calibration records are included in **Appendix G.**

Soil samples were collected using decontaminated hand tools and a new pair of nitrile gloves, directly from disposable push tube liners. Samples were then immediately transferred to laboratory supplied sample jars and bags. The jars were stored in a chilled esky for sample preservation prior to and during shipment to the testing laboratory. The bags were stored out of direct sunlight for approximately 5 minutes, then punctured by the tip of the PID for field assessment of VOC contamination. A chain of custody form will be completed and forwarded with the samples to the testing laboratory.

The final analytical schedule was based on field observations, and detailed in **Table 7.3**

[22] *'Contaminated Site: Sample Design Guidelines'*, NSW Environment Protection Authority, ISBN 0 7310 3746 1, September 1995, EPA (1995)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.4 Groundwater Investigation

7.4.1 Groundwater Monitoring Well Installation

Seven groundwater monitoring wells were installed, as shown in **Figure 4A** and **4B**. The locations of the wells are as follows:

- JBMW01: 50 m to 60 m west of the dry cleaner, adjacent to the northern boundary of the site.
- JBMW02: 2 m north of the site boundary, approximately 10 m north of the dry cleaner, within the Henry Street road reserve;
- JBMW03: immediately northwest of The Service Station, within the footpath;
- JBMW04: 50 m to 60 m west of the dry cleaner, approximately in alignment with the undergrounds sewer infrastructure;
- JBMW05: 15 m north of the site boundary, approximately 25 m northwest of the former dry cleaner;
- JBMW06: 80 m north of the site boundary, approximately 100 m north of the former dry cleaner; and
- JBMW07: 95 m north of the site boundary, approximately 110 m north west of the former dry cleaner.

The wells were generally installed to the top of the shale bedrock and screened from the depth of installation to the top of the river gravel layer. Groundwater monitoring well installation logs are included in **Appendix F**. It is noted that wells JBMW02 was not able to be installed to the top of the shale bedrock due to hole collapse and preclusion of readily implementable drilling methods, such as hollow flight auger, because of the presence of large river gravels. JBMW02 was installed within the river gravel layer. A bentonite plug was utilised at each monitoring well to seal the river gravel layer from the borehole created during well installation. No evidence of gross contamination from the dry cleaner was identified during drilling.

The wells were constructed from 50 mm un-plasticised polyvinyl chloride (uPVC) screen and casing, combined with a lockable cap and steel gatic cover. Surrounding the uPVC screen a graded (2mm) sand was utilised to construct a 'gravel pack' which limited clogging of the screen with excess sediments/soils. Additionally, above the screened interval, a bentonite seal was installed to reduce the potential for surface water, perched water and/or liquid phase contaminants to enter the well. A steel gatic cover was installed at the ground surface within concrete, flush with the surroundings.

7.4.2 Well Development and Sampling

After installation, the new and previously installed monitoring wells were developed to remove excess silt and sediment resultant from the installation process. The wells were then allowed to settle for a week prior to sampling. Groundwater sampling was conducted in accordance with the Groundwater Sampling Guidelines, VIC EPA (2000[23]).

Each monitoring well was gauged with an Interface Probe (IP) which can detect NAPLs. The groundwater at each well was then purged with a QED low flow/micropurge submersible bladder pump, using fresh disposable bladders and low-density polyethylene tubing, to remove the standing water. During removal, physiochemical parameters (pH, electrical conductivity, dissolved oxygen, reduction-oxidation potential and temperature) were monitored until stabilisation. Groundwater samples were taken from the end of the disposable LDPE tubing after parameter stabilisation has occurred.

[23] *'Groundwater Sampling Guidelines'*, Victoria Environment Protection Authority, April 2000, VIC EPA (2000);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Collected groundwater samples were immediately filtered (as necessary) and transferred to laboratory supplied sample bottles. The sample containers were transferred to a chilled iced box for sample preservation prior to and during shipment to the testing laboratory. A chain of custody form was completed and forwarded with the samples. Samples were analysed in accordance with the laboratory schedule (**Table 7.3**).

It is noted that an obstruction present within PSM03 precluded sampling with a micro-purge submersible pump. On this basis, a sample was collected using a foot-valve. The foot-valve sampling methodology may result in underestimation of volatile compounds within collected samples. As a result, the results from PSM03 should be considered indicative only.

7.5 Soil Vapour Assessment

Seven soil vapour probes were installed in the locations marked on **Figure 4C**. Soil vapour probes were installed via the following process:

- Clearance of proposed soil vapour locations by a professionally licenced service locator;
- Puncture of surface hardstand (concrete or asphaltic pavement) via rotary hammer drill, with a 20 mm drill bit, through to the underlying soils;
- 'Flossing' of the drill hole to remove excess concrete dust and/or soil;
- Installation of a 300 – 400 mm nylon tube, fitted with steel mesh filter on the bottom and closed three-way valve on the accessible end;
- Backfilling the drill hole with graded sand, to a minimum of 5 cm above the steel mesh filter;
- Sealing of the drill hole via application of air drying clay covered by a concrete/bentonite slurry;
- Allowing the soil-vapour probe to equilibrate for a period of 30 minutes following sealing with concrete/bentonite slurry;
- Application of a 'shroud' comprising an air tight container lined with isopropyl alcohol doused material to the base of the nylon tube, where sealed in place with the bentonite slurry;
- Purging of the drill hole via pumping through a calibrated mx6 multi-gas detector;
- Concentrations of oxygen (O_2), VOCs and carbon dioxide (CO_2) were monitored throughout purging until stabilization had occurred;
- Where detections of VOCs indicated a leak as present and isopropyl alcohol vapour was intruding into the nylon tube, the soil vapour probe will be removed and reinstalled;
- Where purging was successful, and no leak is indicated by monitored parameters, 25.0 L of soil vapour was removed from the sub-slab vapour probe using a calibrated low-low air pump. The pump was connected to the back end of a carbon tube, allowing for soil vapour to be drawn over the activated carbon; and
- Removal of the soil vapour probe post-sampling and reinstatement of the drill hole with concrete, consistent with the surrounds.

Soil vapour installation logs from JBS&G (2017) and the current assessment are provided in **Appendix F.** This sub-slab soil-vapour probe installation methodology is similar to 'direct push' push methods in the potential for atmospheric ingress during installation. Consistent with the NEPC (2013) recommendation for equilibration period for 'direct push' methods 30 minutes is adequate to allow equilibration of the sub-slab probe with the surrounding soil-vapour.

The carbon tubes were immediately transferred into a labelled, sealed container and stored within an icebox at ambient temperature, consistent with laboratory advice and NATA accreditation of the

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

sample handling. Samples were not chilled in order to minimise the potential for condensation on and within the tube, which may compromise the sample.

In addition to the above, two deep soil vapour probes (SV18 and SV19) were installed on the northern side of Henry Street (**Figure 4C** and **4D**). The probe installation logs are presented in **Appendix F**. Deep probes were installed on 5 November 2018 and sampled on 15 November 2018 (10 days equilibration period). Deep soil vapour probes were sampled by extraction of a 6 L volume of soil-vapour with calibrated low-flow pumps (100 mL/min for 60 minutes) and monitoring of soil gases with a calibrated multi gas meter. The soil vapour sampling probes of SV18 and SV19 were installed to a depth interval of 4.7 m to 5.0 m bgs. These depth intervals were selected to minimise the potential for soil moisture present directly above the water table to influence the sampling results. JBSV18 and JBSV19 construction details are provided following:

- **JBSV18**
  Probe tip/filter – 4.8-4.9 m bgl
  Sand pack (well) – 4.7-5.0 m bgl
  Bentonite (seal) – 2.7-4.7 m bgl
  Concrete (seal) – 0-2.7 m bgl
- **JBSV19**
  Probe tip/filter – 4.8-4.9 m bgl
  Sand pack (well) – 4.7-5.0 m bgl
  Bentonite (seal) – 3.7-4.7 m bgl
  Concrete (seal) – 0-3.7 m bgl

7.6 Indoor Air Assessment

Three premises were assessed for COPCs in indoor air, Shop 1 and Shop 3/134-138 Henry Street and Shop 3/140 Henry Street, as shown on **Figure 4D**. The indoor air assessment was undertaken over four single day mobilisations, targeting atmospheric conditions conducive to incurring the 'worst case' scenario for soil vapour to indoor air advection. One sampling event was undertaken when the site was predicted to be experiencing a decreasing atmospheric pressure on 17 April 2018, and the other sampling events were undertaken during hot conditions 35^{o}C on 9 April, 3 May and 15 November 2018 (BOM 2018[24]).

The sampling locations were selected based on the site layout encountered during the sampling event, which was intended to target an area of low air flux (water closets) and an area nearby to air conditioning/atmospheric control equipment within general occupational areas (shop areas).

Ambient air was sampled for a period of approximately 8 hours, representative of a commercial worker's daily shift), during the worst-case conditions. Samples were collected via Summa Canister and analysed in accordance with **Table 7.1**

7.7 Decontamination

Prior to the commencement of sampling activities, non-disposable sampling equipment (solid flight augers, rotary hammer drill and interface probe) were cleaned with a high-pressure water/detergent (Decon 90) spray, rinsed with water and then air dried. The equipment was then inspected to ensure that no soil, oil, water, debris or other contaminants are apparent on the equipment prior to the commencement of works. This decontamination procedure was repeated in between each sampling location before ground disturbance/sampling activities.

[24] *'Penrith, New South Wales, April 2018 Daily Weather Observations'*, Product IDCJDW2111.201804 Prepared on Monday 30 April 2018, Station 067113, Bureau of Meteorology (BOM 2018);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Soil samples were collected from push tube sleeves which were removed from the advancement casing and laid on clean plastic sheets for inspection, soil samples were collected directly from the push tube sleeve. A new pair of disposable nitrile gloves were used to collect each sample.

Non-disposable groundwater monitoring and soil vapour probe installation equipment was decontaminated in accordance with the procedure detailed above in between each monitoring well/soil vapour probe location. Soil vapour and groundwater samples was collected using dedicated disposable sampling equipment which was disposed of after each individual sample.

Sampling equipment including, hand trowels, hand augers and the push tube head were subsequently decontaminated using the above process between each sampling location and fresh liners were used at each location advanced via push tube. Decontamination records are provided in **Appendix G**.

A rinsate sample from the non-disposable sampling equipment was progressively collected in between sampling locations to determine the effectiveness of the decontamination procedures implemented on re-usable sampling equipment. The rinsate sample was analysed for each of the COPCs, analysed within primary samples.

7.8 Duplicate and Triplicate Sample Preparation

At selected sample locations, sufficient media was collected to provide a primary, blind (intra-laboratory) duplicate and split (inter-laboratory) duplicate (triplicate) sample using the sampling methodologies outlined above.

The collected soil samples were divided laterally into three samples with minimal disturbance to reduce the potential for loss of volatiles and placed in three clean glass jars and sample bags as appropriate. Soil samples were not homogenised in order to minimise the loss of volatiles.

The collected groundwater samples were extracted from the groundwater wells after purging and the primary, blind duplicate and split duplicate sample containers were filled consecutively, one quarter at a time. Groundwater samples were not homogenised in order to minimise the loss of VOCs.

The collected soil vapour samples were extracted from soil vapour probes after purging. Sub-slab intra-laboratory duplicate samples were collected simultaneously to the primary sample (at location SV15) by application of a second pump adjoined to the sample train with a Y-splitter (three way valve). Sub-slab duplicate samples were collected simultaneously to avoid differences in advection as a result of changing weather conditions. Deep soil-vapour intra- and inter-laboratory duplicate samples were collected immediately following collection of the primary samples.

7.9 Laboratory Analysis

JBS&G contracted Eurofins MGT (Eurofins) as the primary laboratory for the required chemical analyses. The secondary laboratory was Envirolab Services Pty Ltd (Envirolab). Both laboratories were NATA accredited for the required analyses. In addition, the laboratories were required to meet JBS&G's internal QA/QC requirements. The completed analysis schedule is summarised in **Table 7.3.**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 7.3 Analytical Schedule

Sample Type	Round	No. of Sampling Locations	Analyses (exc. QA/QC)
Soil	Round 1 (9 and 10 April 2018)	4 Borehole Locations (JBMW01, JBMW02, JBMW03 and JBMW04)	TRHs and VOCs – 8 samples PAHs – 3 samples Lead – 3 samples Heavy metals – 1 sample
	Round 2 (5 November 2018)	1 borehole location (JBMW05)	Total organic carbon content – 2 samples
Soil Leachate	N/A (9 and 10 April 2018)	1 Borehole Location (JBMW04)	TCLP (PAHs and Lead) – 1 sample
Groundwater	Round 1 (16 April 2018)	7 Monitoring Well Locations (PSM01, PSM02, PSM03, JBMW01, JBMW02, JBMW03 and JBMW04)	vTRH/BTEX – 7 samples svTRHs – 6 samples VOCs – 7 samples Heavy metals – 1 sample
	Round 2 (15 and 21 November 2018)	5 Monitoring Well Locations (JBMW02, JBMW05, JBMW06, JBMW07 and PSM01)	VOCs/BTEX – 5 samples Nitrate, Sulfate, Chloride and Ferrous Iron – 3 samples Methane, Ethene, Ethane – 3 samples pH, Total Organic Carbon – 3 samples Alkalinity – 3 samples
Soil Vapour	Round 1 (17 April 2018)	7 Sub-slab Soil Vapour Probe Locations (SV11 to SV17)	VOCs – 7 samples
	Round 2 (15 November 2018)	2 Soil Vapour Wells (SV18 and SV19)	VOCs – 2 samples
Indoor Air Assessment	Round 1 (9 April 2018)	2 Buildings, 4 Locations	T015 VOCs – 4 samples
	Round 2 (17 April 2018)	2 Buildings, 2 Locations and ambient air	T015 VOCs – 5 samples
	Round 3 (3 May 2018)	1 Building, 1 Location	T015 VOCs – 1 sample
	Round 4 (15 November 2018)	2 Buildings, 3 Locations	T015 VOCs – 3 samples

In addition to the above primary analyses, to address the DQIs, field duplicate and triplicate soil, groundwater, and soil vapour samples were analysed at a rate of one per 20 primary samples. A field duplicate sample was collected at one indoor air sampling location. A rinsate sample was obtained from non-disposable sampling equipment each day that soil or groundwater sampling was undertaken, plus a single trip spike and single trip blank accompanied each sample batch where groundwater and soils were analysed for volatile COPCs.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8. Assessment Criteria

8.1 Regulatory Guidelines

Development of site assessment criteria and the associated scope of investigation will be undertaken with consideration to aspects of the following guidelines, as relevant:

- *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1)*, National Environment Protection Council, NEPC (2013);
- *Contaminated Sites: Sampling Design Guidelines*, NSW EPA, 1995, EPA (1995);
- *Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme (3rd Edition).'* NSW Environmental Protection Authority, November 2017, EPA (2017);
- *Contaminated Sites: Guidelines on Duty to Report Contamination under the Contaminated Land Management Act 1997*, NSW DECC, June 2009, DECC (2009); and
- *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*, NSW OEH, 2011, OEH (2011).

8.2 Soil and Soil Vapour Assessment Criteria Selection

As per the decision process for assessment of urban development site, EPA (2017), a set of health and ecological assessment thresholds derived from NEPC (2013) will be used for evaluation of site contamination data collected for this assessment. To assess the risks posed to current and future site users, the analytical data acquired during JBS&G (2017a) and the current assessment have been compared against criteria pertaining to the current site layout (commercial/industrial) and the proposed mixed uses of the site (residential, public open space and commercial/industrial), as noted in **Section 1.1**.

To assess potential risks posed to future site users, the site has been compared to distinct land use criteria for each of the proposed development areas. The western site portion falls within the 'Proposed Green Spaces' and the eastern portion of the site falls within the 'Proposed Building Development and Green Spaces' portion (as shown on **Figure 2**). The site is zoned Commercial Core (B3) and Public Recreation (RE1) under the Penrith Local Environmental Plan 2010, Penrith (2010).

Where there are no NSW EPA endorsed thresholds for individual COPC the laboratory limit of reporting (LOR) was adopted as an initial screening value for the purposes of this assessment.

The adopted site criteria are presented in **Table A(1), Table A(2)** and **Table C.**. Relevant guidelines have been adopted from Section 6 of Schedule B1 NEPC (2013) and are presented below:

Health Based Criteria

Relevant tables:

- Table 1A(1) 'Health Investigation Levels for Soil contaminants';
- Table 1A(2) 'Interim Soil Vapour Health Investigation Levels for Volatile Organic Chlorinated Compounds';
- Table 1A(3) Soil HSLs for Vapour Intrusion;
- Table 1A(4) Groundwater HSLs for Vapour Intrusion;
- Table 1A(5) Soil Vapour HSLs for Vapour Intrusion.

Ecological Screening Levels and Ecological Investigation Levels

Ecological Screening Levels (ESLs) for the site were obtained from Table 1B(6) 'ESLs for TPH Fractions F1-F4, BTEX and Benzo(a)pyrene in Soil' under 'Urban residential and public open space' and 'commercial and industrial' land use scenarios.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Site specific Ecological Investigation Levels (EILs) were derived as part of JBS&G (2017a). The criteria presented in JBS&G (2017a) have been adopted for this assessment.

Management Limits

Management limits for consideration of the formation of Light Non-Aqueous Phase Liquids (LNAPLS), fire and explosive hazards, and effects on buried infrastructure have been obtained from Table 1B(7) 'Management Limits for TPH Fractions F1-F4 in Soil' under 'Urban residential and public open space' and 'commercial and industrial' land use scenarios. The management limit adopted for the purpose of comparison was based on site observations reported in JBS&G (2017a).

Proposed Building Development and Green Spaces

Land use scenarios adopted:

- Residential with minimal opportunities for soil access; includes dwellings with fully and permanently paved yard space such as high-rise buildings and apartments (HIL-B and HSL-B);
- Public open space such as parks and playgrounds (HIL-C and HSL-C);
- Commercial/industrial; including premises such as shops and offices (HIL-D and HSL-D);

Proposed Green Spaces

The land use scenario adopted for Proposed Green Spaces site portion is 'public open space such as parks and playgrounds (HIL-C and HSL-C)'

8.3 Groundwater Assessment Criteria

As discussed in **Section 6.5**, it is not expected that groundwater at the site will be extracted and used for drinking water due to the relatively high salinity/total dissolved solids observed at all monitoring well locations. However, as a conservative guideline, the health and aesthetics based *Australian Drinking Water Guidelines* (NHMRC 2017[25]) for drinking water have been adopted for the purposes of the assessment.

Conservative screening criteria, for the assessment of risk to construction/maintenance workers as a result of short term work involving interaction with groundwater at the site, has been adopted as 10 times the health values for Drinking Water published in (NHMRC 2017).

To assess the potential risk of contaminated groundwater migrating from the site to Peach Tree Creek, reference has been made to the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* ANZAST (2018[26]). Given the heavily urbanised nature of the receiving water body, a 95 % protection of species value has been adopted. Where no high reliability values have been specified, low reliability values have been utilised for the purpose of site assessment and screening.

For the purpose of screening, groundwater assessment criteria have also been adopted from the United States Environment Protection Agency *Regional Screening Levels for Residential Tap Water* (US EPA 2018[27]) when guidelines are not present in the adopted GIL or HSL (noting the RSLs are conservatively based on an excess lifetime cancer risk of 10^{-6}).

8.4 Indoor Air Criteria

The criteria for assessment of indoor air concentrations is adopted from the NEPM (NEPC 2013). Consistent with Table 1A(2) 'Interim Soil Vapour Health Investigation Levels for Volatile Organic Chlorinated Compounds', interim soil vapour HILs were calculated based on adjusting by the attenuation factor for concentrations of Volatile Organic Chlorinated Compounds (VOCCs) in indoor

[25] *'National Water Quality Management Strategy – Australian Drinking Water Guidelines 6 2011', National Health and Medical research Council,* October 2017, NHMRC 2011;

[26] *'Australian and New Zealand Guidelines for Fresh and Marine Water*Australian and New Zealand and Austrlaian State and Territory Governments, ANZAST (2018);

[27] *Regional Screening Levels for Residential Tap Water*. United States Environment Protection Agency, May 2018, US EPA 2018;

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

air to sub-slab soil vapour of 10 as adopted in NEPC (2013) for the derivation of the criteria. On this basis, the adopted screening criteria was calculated by multiplying the interim soil vapour HILs by 0.1.

The current indoor air assessment is being undertaken to assess risks to current site users under the ongoing commercial/industrial land use. On this basis, no comparison with criteria for other land use scenarios has been undertaken.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

9. Quality Assurance / Quality Control

Analysis of the Quality Analysis / Quality Control (QA/QC) has been undertaken for the analytical results as summarised in **Table 9.1** and discussed in **Section 7.2**. Detailed QA/QC results are included in the laboratory reports in **Appendix H**, and in the Quality Assurance/Control in **Appendix I.**

Table 9.1 QA/QC Results Summary

Data Quality Indicator	Results	DQI met?
Precision		
Soil Blind duplicates (intra laboratory)	0-67 % RPD Intra laboratory samples were analysed at a rate greater than 1 in 20 samples.	Partial[1]
Soil split duplicates (inter laboratory)	0-67 % RPD Inter laboratory samples were analysed at a rate greater than 1 in 20 samples.	Partial[1]
Groundwater blind and split duplicates (intra- and inter-laboratory)	0-189 % RPD Intra laboratory samples were analysed at a rate of 1 in 7 samples.	Partial[1]
Soil vapour blind and split duplicates (intra- and inter- laboratory)	0-79 % RPD Intra laboratory samples were analysed at a rate of 1 in 7 samples.	Partial[1]
Indoor Air blind duplicates (intra-laboratory)	0-4 % RPD	Yes
Laboratory duplicates	0-50 % RPD Intra laboratory samples were analysed at a rate greater than 1 in 20 samples.	Yes
Accuracy		
Surrogate spikes	58-130 % Recovery Surrogate spikes were completed for all organic samples	Partial[1]
Laboratory Control Samples	70-130 % Recovery Laboratory control samples were completed for all organic and metals samples	Yes
Matrix spikes	70-132 % Recovery Matrix spikes were completed for all organic and metals samples	Partial[1]
Representativeness		
Sampling appropriate for media and analytes	All sampling conducted in accordance with JBS&G procedures	Yes
Laboratory blanks	<LOR	Yes
Samples extracted and analysed within holding times.	Samples analysed for VOCs were extracted outside of holding times	Partial[1]
Trip spikes	85-111%	Yes
Trip blanks	<LOR	Yes
Rinsate blank	<LOR-EQL	Partial[1]
Carbon tube breakthrough control samples	1 per primary sample	<LOR
Background samples	1 per sampling event	<Criteria
Comparability		
Standard operating procedures used for sample collection & handling	Three JBS&G field scientists used standard operating procedures throughout works.	Yes
Standard analytical methods used	Standard analytical methods used as listed detailed in **Appendix L**	Yes
Consistent field conditions, sampling staff and laboratory analysis	Sampling was conducted by three field staff members using standard operating procedures in the same conditions throughout the works. The laboratories remained consistent throughout the investigation.	Yes
Limits of reporting appropriate and consistent	Limits of reporting were consistent and appropriate.	Yes

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Data Quality Indicator	Results	DQI met?
Completeness		
Soil description & Chains of Custody completed	All borehole logs and Chains of Custody were completed appropriately.	Yes
Appropriate documentation	All appropriate field documentation processes were undertaken. Borehole logs and Calibration/ Decontamination records are included as **Appendix G**.	Yes
Satisfactory frequency/result for QC samples	The QC results are considered adequate for the purposes of the investigation.	Yes
Data from critical samples is considered valid	Data from critical samples is considered valid.	Yes
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	Appropriate laboratory analysis methods and detection limits were considered to have been achieved during the field and laboratory phases of this investigation.	Partial[1]

1. See discussion of DQI exceedances in **Section 7.2**.

9.1 QA/QC Discussion

9.1.1 Precision

Soil Duplicates

Two primary samples were split into intra and inter laboratory duplicate samples: JBMW03 8.0-8.2 (QA 9-4 and QC 9-4) and JBMW04 0.2-0.3 (QA 10-4 and QC 10-4). Duplicate sample analytical rates are presented as follows:

- QA 9-4 and QC 9-4 were analysed for TRHs and VOCs, at a rate 1 duplicate per 8 primary samples; and
- QA 10-4 and QC 10-4 were analysed for PAHs, at a rate of 1 duplicate per 4 primary samples;
- QA 10-4 and QC 10-4 were analysed for heavy metals, at a rate of 1 duplicate per 1 primary sample.

Concentrations of COPCs reported in intra and inter laboratory duplicate samples were within the acceptable limits of deviation from the primary samples for all analytes with the exception of the following:

- Cadmium: JBMW04 0.2-0.3 (0.6 mg/kg), QA 10-4 (1.8 mg/kg) and QC 10-4 (4.1 mg/kg). Cadmium exhibited an RPD of 100 % and 149 % between the primary and the intra and inter laboratory samples respectively;
- Mercury: JBMW04 0.2-0.3 (0.2 mg/kg), QA 10-4 (1.3 mg/kg) and QC 10-4 (0.6 mg/kg). Mercury exhibited an RPD of 147 % and 100 % between the primary and the intra and inter laboratory samples respectively;
- Nickel: JBMW04 0.2-0.3 (13.0 mg/kg) and QA 10-4 (32.0 mg/kg). Nickel exhibited an RPD of 84 % between the primary and the intra laboratory sample;
- Zinc: JBMW04 0.2-0.3 (370.0 mg/kg) and QA 10-4 (690.0 mg/kg). Zinc exhibited an RPD of 60 % between the primary and the inter laboratory sample; and
- Total PAHs: JBMW04 0.2-0.3 (1.4 mg/kg) and QA 10-4 (<0.5 mg/kg). Total PAHs exhibited an RPD of 95 % between the primary and intra laboratory sample.

The RPDs for the intra-laboratory and inter-laboratory duplicates are presented in **Appendix I** and are considered to be the result of heterogeneity in the fill material sampled at JBMW04 0.2-0.3. The elevated RPD results are considered to have no influence on the information used to make decisions identified in **Section 7.1.2.**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Groundwater Duplicates

Three primary groundwater samples were split into intra and inter laboratory duplicate samples: JBMW01 (QC20180416 and QA20180416),JBMW03 (QC20180416-1 and QA20180416-1) and PSM01 (QA151118 and QC15118). Duplicate sample analytical rates for COPCs are presented as follows:

- QC20180416 and QA20180416 were analysed for volatile TRHs, at a rate 1 duplicate per 7 primary samples;
- QC20180416, QA20180416, QA151118 and QC15118 were analysed for VOCs at a rate of 2 duplicates per 12 primary samples;
- QC20180416-1 and QA20180416-1 were analysed for semi-volatile TRHs, at a rate of 1 duplicate per 6 primary samples;
- QC20180416-1 and QA20180416-1 were analysed for heavy metals and PAHs at a rate of 1 duplicate per 1 primary sample; and

Concentrations of COPCs reported in intra and inter laboratory duplicate samples were within the acceptable limits of deviation from the primary samples for all analytes. The RPDs for the intra-laboratory and inter-laboratory duplicates are presented in **Appendix I**.

Soil Vapour Duplicates

Laboratory intra-laboratory duplicate samples were analysed at a rate of 2 duplicates per 9 primary samples. All intra-laboratory duplicates were reported to have an RPD of less than 50 A% except for QA-V (primary SV18), which was reported to have an RPD of 79 % for PCE. This elevated RPD is considered not to have affected the quality of the data set for the intended purpose, given the concentrations reported for this analyte were greater than two orders of magnitude above relevant assessment criteria.

Laboratory inter-laboratory duplicate samples were analysed at a rate of 1 duplicates per 9 primary samples. All inter-laboratory duplicates were reported to have an RPD of less than 50 %.

Laboratory Duplicates

All laboratory duplicates returned RPDs within the acceptable limits.

Summary of Precision

No indoor air duplicates were analysed as part of this assessment. Given the simplicity of the methodology employed to sample indoor air, there is limited potential to introduce field-based sampling errors, as demonstrated by analysis of the intra-laboratory duplicate sample. Laboratory duplicates, surrogate samples and laboratory control samples were recovered within the NATA accreditation limits, indicating limited potential for imprecision in analytical methods

Based on the above this minor deviation from the assessment DQOs is considered not to have substantially affected the quality of the data set for the intended purpose of the investigation. On this basis the DQIs for precision are considered to have been achieved for this investigation.

9.1.2 Accuracy

Surrogate spike recoveries were within the acceptable range of 70-130 % for all primary samples analysed, except for the following under-recoveries:

- PAH surrogate 2-Fluorobiphenyl was reported to be recovered at the following proportions: 58 % and 61 % (JBMW04 0.2-0.3) and 56 % (JBMW03); and
- VOC surrogate 4-bromofluorobenzene was reported to be recovered at a proportion of 61 % in sample SV15 – FRONT.

These deviations from the acceptance criteria were not considered to have an impact on the conclusions of this assessment as no PAH or VOC compounds were reported within one order of

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

magnitude of the assessment criteria for the samples to which the under-recoveries pertain. It is noted that all samples listed above were within the NATA acceptable limits of 50-150.

Laboratory control sample (LCS) recoveries were within the acceptable range of 70-130 % for all the analysed samples.

Matrix spike recoveries were within the acceptable range of 70-130 % within all primary samples analysed, except for zinc which was over recovered in one sample. The laboratory has noted that the over-recovery occurred in a sample which does not pertain to samples collected from the site.

On this basis the DQIs for accuracy are considered to have been achieved for this investigation.

9.1.3 Representativeness

Sample Holding Time

In general, extraction and analysis of samples was completed within the recommended holding times. It is noted that the following samples were extracted outside of holding times: JBMW03 (PAHs), JBMW03 2.0-2.1 (PAHs) and JBMW04 1.0-1.2 (VOCs and TRHs). The samples were extracted between 10 and 23 days outside of holding times. No contaminants were reported within the analysed samples above the laboratory limit of reporting. These sample results have been utilised as indicative data only, and have not been relied upon to make decisions identified in **Section 7.1.2**.

Rinsate Samples

A rinsate sample was collected following decontamination of all non-disposable sampling equipment for each day of the primary soil and groundwater sampling (totalling three rinsate samples). Analyte concentrations were generally not detected within the rinsate samples above the laboratory limit of reporting, with the exception of styrene, which was detected at a concentration of 0.001 mg/L in RINS (9-4-18). In absence of any potential site sources for styrene, and no detections of styrene above the laboratory limit of reporting within in any of the primary samples analysed, it is considered likely that this minor detection was the result of laboratory contamination. On this basis, no evidence for cross contamination between sample locations has been identified. Decontamination records are presented in **Appendix G**.

Trip Spike, Trip Blank and Laboratory Blank Samples

A trip spike was submitted with each laboratory batch for soil and groundwater samples collected during the assessment. Trip spike recoveries for analytes was within the acceptable limit of 70-130 %.

A trip blank was submitted with each laboratory batch for soil or groundwater samples collected during the assessment. There were no reported concentrations of BTEX compounds above the laboratory LOR.

All laboratory blanks analysed reported analyte concentrations less than the laboratory LOR.

The soil-vapour method blank sample, and ambient outdoor air 'background' sample, discussed below, have demonstrated that sample handling procedures did not adversely affect the reliability of the dataset for indoor air or soil-vapour.

Soil Vapour Representativeness

All soil vapour samples were analysed for the presence isopropyl alcohol to determine whether or not atmospheric interference had occurred during sampling. No detections of isopropyl alcohol were reported above the laboratory LOR.

Analysis of carbon tube samples was undertaken on the 'front' and 'back' of the tubes. In all cases, no constituents were reported in the 'back' of the tube which confirms that the carbon tubes were operated within the extent of soil vapour levels they can reasonable be considered to quantify.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Method Blank Samples

A method blank was submitted alongside the soil vapour samples. The method blank sample was prepared by drawing 25 L of ambient outdoor air at the site through a soil-vapour probe assembly prior to installation. Analysis of the method blank indicated that no COPCs were present above the laboratory limit of reporting.

Background Sample

A background sample was submitted alongside the 2nd round of ambient air samples (17 April 2018) which reported concentrations of COPCs below the adopted site investigation criteria. In addition, no target CEs were detected above the laboratory LOR. On this basis, the potential for contamination of samples as a result of sample handling procedures has not adversely affected the reliability of the dataset.

Decontamination Procedure

All field equipment was decontaminated appropriately as per the procedure identified in **Section 5.2.3**. Collected samples were immediately placed into the sample containers, sealed and then placed into chilled eskies to minimise volatile loss.

Sampling Methodology

Due to the presence of an obstruction in PSM03, a sample was required to be collected using a foot-valve. Foot-valve sampling may result in the disturbance and release of volatile chemicals from sample media, resulting in an underestimation of concentrations. Results from PSM03 for volatile constituents should be considered to be indicative only.

Summary of Representativeness

Based on the above comments, the DQIs for representativeness were considered to have been satisfactorily achieved.

9.1.4 Comparability

Eurofins, the primary laboratory (soil, groundwater and soil vapour), and Envirolab Services, the secondary laboratory (soil, groundwater and soil vapour) and primary ambient air laboratory, are NATA accredited for all analytical methods used. The laboratories used similar analytical methods and the analytical data were comparable between laboratories as indicated by the results of duplicate analysis.

The sampling methodology utilised for the assessment was consistent, as conducted by experienced JBS&G personnel in accordance with standard JBS&G sampling methods.

9.1.5 Completeness

All laboratory and field documentation is complete and correct. Chain of custody documentation is provided with laboratory reports in **Appendix H**. Bore hole logs are presented in **Appendix F**.

The frequency of analysis of all QA/QC samples was considered appropriate and valid.

9.1.6 Sensitivity

The adopted soil analytical methods provided suitable LORs for the purpose of making decisions identified in **Section 7.1.2**.

9.1.7 QA/QC Conclusions

The field sampling and handling procedures across the site produced QA/QC results which indicate that soil, groundwater and soil vapour data collected is of an acceptable quality.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

The NATA certified laboratory reports indicate that the project laboratories were achieving levels of performance within its recommended control limits during the period when the samples from this program were analysed.

On the basis of the results of the field and laboratory QA/QC program, the soil data is of an acceptable quality upon which to draw conclusions regarding the environmental condition of the site.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

10. Results

10.1 Lithology and Soil Observations

Borehole drilling was conducted via mechanical drill rig on 9 and 10 April 2018 at the sample locations JBMW01 to JBMW04, shown on **Figure 3A**. Borehole logs are presented in **Appendix F**. The lithological and soil profiles observed were generally consistent with those previously encountered and described in **Section 4.2.3**.

As discussed in **Section 2.2** the site is almost entirely sealed by building footprints, concrete slabs and asphaltic pavements, with residual areas comprising garden beds and tree pits. Shallow fill material was encountered underlying hardstand pavements at JBMW01 (0 m – 1.2 m bgs), JBMW02 (0.3 m – 0.4 m bgs) and JBMW04 (0.1 m – 0.5 m bgs), comprising brown silty clay. Minor inclusions of slag were observed in the fill material at JBMW04.

Soils underlying fill material were generally silty and sandy mottled clays, varying in colour between orange, brown and grey. The encountered clays were noted to be very hard, exhibiting minor plasticity and considerable resistance to the drill rig. Within the clayey profile, bands of sand were observed, comprising approximately 0.9 m and 3.3 m of the soil profile in JBMW03 and JBMW04 respectively.

River gravels were encountered, overlying a weathered shale bedrock. All four boreholes were terminated on shale bedrock. The river gravel layer was noted to be heterogeneous in structure between locations, characterised as follows:

- JBMW01: sandy gravel – 6.50 m to 12.00 m bgl;
- JBMW02: gravelly sandy clay – 7.50 m to 11.50 m bgl;
- JBMW03: gravelly sand – 8.90 m to 12.10 m bgl; and
- JBMW04: gravelly clay – 7.50 m to 11.60 m bgl.

Soil samples were collected at regular (0.5 m to 1.0 m) intervals and analysed with a calibrated PID. PID readings ranged from 4.5 parts per million (ppm) to 14.3 ppm. No olfactory or visual indicators of volatile organic compound contamination were noted. Asbestos containing material, odours, staining or other indicators of potential contamination were not observed within the soil profile.

10.2 Soil Analytical Results

Detailed laboratory reports and chain of custody documentation are provided in **Appendix H**. Summarised soil analytical data from JBS&G (2017a) and the current assessment are presented in **Table A(1) Health Investigation Criteria** and **Table A(2) Ecological Investigation Criteria**. Statistical analyses undertaken on the data set are presented in **Appendix M** and are discussed in **Section 8.2.1** to **Section 10.2.6**.

Historical soil analytical data is presented for completeness. Where historically reported exceedances of the site criteria were noted in JBS&G (2017a), updated statistical analysis of the contaminant data set, incorporating current investigation results, has been undertaken to determine whether historical site investigation criteria exceedances are statistically significant in light of new data.

10.2.1 Heavy Metals

Individual heavy metal concentrations were generally reported at levels less than the adopted health and ecological based assessment criteria, with the following notable exceptions:

- Lead in soil concentrations reported in sampleJHA02 0.3-0.5 (910 mg/kg), exceeding the HIL-C criterion. Statistical analyses undertaken as part of JBS&G (2017a) indicated that this exceedance was not statistically significant exceedance of the site investigation criteria.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Incorporation of recent soil analytical data for lead to the statistical has indicated that the exceedances are not statistically significant based on the following:

- The maximum concentration is less than 250 % of the investigation criteria;
- The standard deviation of the data set is less than 50 % of the investigation criteria; and
- The 95 % UCL is less than the site investigation criteria.

- Copper in soil concentrations reported in sample JHA02 0.1-0.3 and JHA02 0.3-0.5 were 230 mg/kg and 200 mg/kg respectively, exceeding the site specific EIL criterion (179 mg/kg). Statistical analyses undertaken as part of JBS&G (2017a) indicated that these exceedances were not statistically significant. Incorporation of recent soil analytical data for copper to the statistical analysis has indicated that these exceedances are not statistically significant based on the following:
  - The maximum concentration is less than 250 % of the investigation criterion;
  - The standard deviation of the data set is less than 50 % of the investigation criterion; and
  - The 95 % UCL is less than the site investigation criterion.
- Zinc in soil concentrations reported in the blind and split duplicate samples of primary sample JBMW04 0.2-0.3, QA 10-3 (470 mg/kg) and QC 10-4 (690 mg/kg). The concentrations for zinc in soil reported exceeded the adopted EIL criterion (JHA02 0.1-0.3) and both the EIL-C and HIL-C criteria (JHA02 0.3-0.5). Statistical analyses undertaken on the dataset for concentrations of zinc in soil has indicated that these exceedances are not statistically significant exceedances of the site investigation criteria based on the following:
  - The maximum concentration is less than 250 % of the investigation criteria;
  - The standard deviation of the data set is less than 50 % of the investigation criteria; and
  - The 95 % UCL is less than the site investigation criteria.

10.2.2 Polycyclic Aromatic Hydrocarbons

Total PAH, B(a)P and carcinogenic PAHs as B(a)P Toxic Equivalence Quotient (TEQ) values for the analysed samples were generally reported at concentrations less than the adopted site assessment criteria, except for the concentration of B(a)P at location JHA02 0.3-0.5 (0.9 mg/kg), which exceeded the adopted ESL for the Residential and Public Open Space' land use scenario. Statistical analysis of the dataset for concentrations of B(a)P in soil, incorporating current investigation data, indicated that this concentration did not comprise a statistically significant exceedance of the site criterion.

10.2.3 Total Recoverable Hydrocarbons

Concentrations of all TRHs were generally reported below the adopted health and ecological site assessment criteria in soil samples selected for analysis. TRH Fraction C_{10}-C_{16} was detected in sample JB11 0.05-0.1 at a concentration of 710 mg/kg, exceeding the ESL for Residential and Public Open Space criterion. Statistical analyses undertaken on the dataset for concentrations of TRH Fraction C_{10}-C_{16} in soil has indicated that this exceedance is not statistically significant based on the following:

- The maximum concentration is less than 250 % of the investigation criteria;
- The standard deviation of the data set is less than 50 % of the investigation criteria; and
- The 95 % UCL is less than the site investigation criteria.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

10.2.4 Volatile Organic Compounds

Concentrations of all VOCs were reported to be below the adopted site investigation criteria. It is noted that chlorinated ethenes were detected above the laboratory limit of reporting in samples JHA04 0.2-0.4 (PCE – 3.7 mg/kg) and JHA04 0.6-0.8 (PCE 0.6 mg/kg and TCE 0.7 mg/kg).

10.2.5 Total Organic Carbon

Two samples of soils from the saturated horizon were collected from JBMW05 and submitted for analysis of total organic carbon content. Concentrations were reported between 0.1 % (clay soils – MWSV 6.9-7.0) and 0.4 % (gravelly clay soils- MWSV 7.9-8.0).

10.3 Groundwater Field Observations

Three groundwater monitoring events (GMEs) were conducted on the site and surrounding area (16 April, 15 and 21 November 2018). A summary of groundwater conditions encountered during the GMEs is presented in **Table 10.1**, **Table 10.2** and **Table 10.3** below. Groundwater monitoring well locations are provided on **Figure 4B**. **Figure 4B** also shows inferred groundwater contours based on the encountered groundwater levels (m AHD), topographical and hydrological features of the site. Field sheets recorded during the GME are presented in **Appendix J.**

A registered surveyor was engaged to determine the position of groundwater monitoring wells (PSM01 to PSM03 and JBMW01 to JBMW04) sampled as part of the first GME. The surveyor utilised real-time kinematic global navigation satellite system for latitudinal and longitudinal positioning in conjunction with differential levelling for well heights. The surveyors report is provided in **Appendix K**.

Groundwater levels were obtained during groundwater well installation and during sampling. The water levels encountered are presented in **Appendix F** and **Appendix J**. It is noted that, due to variable and generally low hydraulic conductivity of the target aquifer, the standing groundwater levels observed during installation and sampling of the wells were considered unrepresentative of the groundwater system. As a result, a subsequent gauging activity was undertaken, on 3 May 2018, on PSM01 to PSM03 and JBMW01 to JBMW04 following the initial GME. Stabilised standing water levels were recorded, and groundwater flow direction calculations based on these levels. The stabilised standing water levels are presented in **Table 10.1**.

Table 10.1 Groundwater Geospatial Characteristics

Well Reference	Easting (MGA56)	Northing (MGA56)	Surface Level (m AHD)	Top of Pipe (m AHD)	Depth to Standing Water Level (m bTOC)	Standing Water Level (m AHD)
16 May 2018						
JBMW01	286582.1	6262950.0	27.635	27.555	7.195	20.360
JBMW02	286636.0	6262944.7	27.540	27.455	7.090	20.365
JBMW03	286658.1	6262932.3	27.845	27.710	7.340	20.370
JBMW04	286586.3	6262919.0	27.590	27.515	7.160	20.355
PSM01	286626.3	6262910.5	27.695	27.560	7.190	20.370
PSM02	286651.5	6262867.3	27.865	27.795	7.400	20.395
PSM03	286780.3	6262853.4	28.910	28.810	8.320	20.490
15 November 2018						
JBMW02	286636.0	6262944.7	27.540	27.455	7.181	20.274
JBMW05	-[1]	-[1]	-[1]	-[1]	7.167	-[1]
PSM01	286626.3	6262910.5	27.695	27.560	7.259	20.301
21 November 2018						
JBMW06	-[1]	-[1]	-[1]	-[1]	7.261	-[1]
JBMW07	-[1]	-[1]	-[1]	-[1]	7.275	-[1]

1. Groundwater well geospatial information was not obtained for these wells.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Based on the data above, and assuming consistent subsurface conditions are present , the inferred groundwater flow direction is approximately west-northwest with a hydraulic gradient of 0.00065 m/m.

Table 10.2 Groundwater Field Physicochemical Parameters

Well Reference	Dissolved Oxygen (mg/L)	Electrical Conductivity (µS/cm)	Total Dissolved Solids[3] (mg/L)	pH (units)	Oxidation Reduction Potential (mV)[1]	Temperature (°C)
16 April 2018						
JBMW01	0.73	10 385	6646	6.57	-125.5	22.7
JBMW02	1.13	8075	5168	6.81	-35.9	22.8
JBMW03	0.76	10 799	6911	6.51	-113.4	22.9
JBMW04	0.61	10 721	6861	6.89	-81.8	23.2
PSM01	0.69	8900	5696	6.25	35.0	22.4
PSM02	0.23	10 593	6779	6.85	-127.5	23.9
PSM03	0.85	4421	2829	7.58	119.8	25.8
15 November 2018						
JBMW02	0.75	6079	3091	6.99	-147.1	21.2
JBMW05	1.30	8707	5572	6.53	-39.1	22.4
PSM01	1.33	5969	3820	6.39	-18.9	21.9
21 November 2018						
JBMW06	2.30	6151	3937	6.02	30.3	22.3
JBMW07	1.07	7531	4820	6.67	-64.1	24.7

1. Oxidation Reduction Potential was measured with an Ag/AgCl probe against a reference solution of 3.5 moles potassium chloride and deionized water.
2. values presented for PSM03 were obtained via assessment of a grab sample may not be representative of subsurface conditions.
3. Values for total dissolved solids have been calculated in accordance with the methodology provided in NHMRC (2017), based on a conversion factor of 0.64 from electrical conductivity (µS/cm) to total dissolved solids (mg/L)

Table 10.3 Groundwater Field Physicochemical Parameters

Well Reference	Odour	Sheen	Turbidity	Colour
16 April 2018				
JBMW01	None observed	None observed	Moderate	Brown to orange
JBMW02	None observed	None observed	Moderate	Brown to orange
JBMW03	None observed	None observed	Moderate	Brown
JBMW04	None observed	None observed	Low to moderate	Light brown
PSM01	None observed	None observed	Moderate	Dark grey
PSM02	Sulphurous	None observed	Moderate	Dark grey
PSM03	None observed	None observed	Low to moderate	Yellow
15 November 2018				
JBMW02	None observed	None observed	Clear	Colourless
JBMW05	None observed	None observed	Low to moderate	Brown to orange
PSM01	None observed	None observed	Moderate	Grey
21 November 2018				
JBMW06	None observed	None observed	Moderate	Brown to orange
JBMW07	None observed	None observed	Moderate	Brown to orange

10.4 Groundwater Analytical Results

Detailed laboratory reports and chain of custody documentation are provided in **Appendix H.** Summarised groundwater analytical data for COPCs are presented in **Table B**. The results are discussed in **Section 10.4.1** to **Section 10.4.4**.

Where historically reported exceedances of the site investigation criteria were noted in JBS&G (2017a), they have been discussed in alongside the current analytical data.

10.4.1 Metals

A groundwater sample collected from JBMW03 (16 April 2018) and analysed for concentrations of heavy metals. Heavy metals concentrations within the analysed samples were generally reported to be below the adopted site assessment criteria with the exception of the following:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- JBMW03 (16 April 2018): 0.034 mg/L, exceeding the ANZAST (2018) and NWQMS (2011) criteria; and
- JBMW03 (16 April 2018): 0.024 mg/L, exceeding the ANZAST (2018) criterion.

10.4.2 Total Recoverable Hydrocarbons

Groundwater samples from wells JBMW01, JBMW02, JBMW03, PSM01[28], PSM02 and PSM03 were analysed for concentrations of TRHs. TRHs were generally not detected above the laboratory LOR, with the exception of the following:

- JBMW02 (16 April 2018): 0.15 mg/L (C_6-C_{10});
- PSM01 (16 April 2018): 0.04 mg/L (C_6-C_{10}); and
- PSM02 (16 April 2018): 0.02 mg/L (C_6-C_{10}).

10.4.3 Benzene, Toluene, Ethylbenzene and Xylene

All groundwater samples collected over the three GMEs were submitted for analysis of VOCs including BTEX compounds. BTEX concentrations were reported to be less than the site investigation criteria and generally less than the laboratory LOR. Trace level detections were reported in the following samples:

- PSM01 (16 April 2018): 0.001 mg/L toluene; and
- PSM02 (16 April 2018) 0.002 mg/L toluene.

10.4.4 Polycyclic Aromatic Hydrocarbons

A groundwater sample collected from monitoring well JBMW03 and analysed for concentrations of PAHs. PAH concentrations within the analysed sample were all below the adopted site assessment criteria and laboratory LOR.

10.4.5 Volatile Organic Compounds

All groundwater samples collected over the three GMEs were submitted for analysis of VOCs. VOCs were generally reported to be at concentrations below the adopted site assessment criteria with the following notable exceptions:

- JBMW02 (16 April 2018): 0.15 mg/L PCE, exceeding the ANZAST (2018) and NWQMS (2011) assessment criteria;
- JBMW02 (15 November 2018): 0.073 mg/L PCE, exceeding the ANZAST (2018) and NWQMS (2011) assessment criteria;
- JBMW05 (15 November 2018): 0.12 mg/L PCE, exceeding the ANZAST (2018) and NWQMS (2011) assessment criteria; and
- PSM01 (16 April 2018): 0.06 mg/L PCE, exceeding the NWQMS (2011) assessment criterion; and
- PSM01 (26 May 2018): 0.054 mg/L PCE, exceeding the NWQMS (2011) assessment criterion.

The following compounds were detected above the laboratory limit of reporting, where high reliability ANZAST (2018) criteria are not provided, for the purpose of screening, the concentrations have been compared against low reliability criteria (ANZAST 2018) and the Region 9 RSLs (US EPA 2018):

- 1,2,4-trimethyl benzene: 0.003 mg/L in PSM02 (2017). No low reliability criterion is provided for this compound, this concentration is below the RSL (0.56 mg/L);

[28] Fraction C_6-C_{10} only.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- 1,3,5-trimethyl benzene: 0.001 mg/L in PSM02 (2017). No low reliability criterion is provided for this compound, this concentration is below the RSL (0.6 mg/L);
- 2-Propanone (Acetone): 0.021 mg/L in PSM01 (2017) and 0.01 mg/L in PSM02 (2018). No low reliability criterion is provided for this compound, this concentration is below the RSL (1.8 mg/L);
- Cis-1,2-dichloroethene: 0.002 mg/L in JBMW02 (2018). This concentration is below the low reliability criterion for freshwater (0.7 mg/L, ANZAST 2018); and
- 2-butanone: 0.003 mg/L in JBMW02 and 0.012 mg/L in PSM02. No low reliability criterion is provided for this compound, this concentration is below the RSL (1.2 mg/L).

10.4.6 Natural Attenuation Parameters

Three samples of groundwater (PSM01, JBMW02 and JBMW05 – 15 November 2018) were analysed for natural attenuation parameters. Results are presented following:

Dissolved Gases

- Ethane was not detected above the laboratory LOR in any of the analysed samples;
- Ethene was detected at 0.1 mg/L in JBMW02 and JBMW05, and was not detected in PSM01; and
- Methane was detected in PSM01 at a concentration of 0.78 mg/L, in JBMW02 at 0.09 mg/L and not detected at JBMW05.

Physiochemical Parameters

- Ferrous Iron ranged from less than the laboratory limit of reporting to 1.7 mg/L;
- Nitrate ranged from less than the laboratory limit of reporting to 1.2 mg/L;
- Sulphate ranged from 59 to 280 mg/L;
- Chloride ranged from 2800 to 2900 mg/L;
- Alkalinity ranged from 400 to 620 mg/L;
- pH was measured between 6.5 and 8.2 pH units; and
- Organic carbon ranged from 2 mg/L to 28 mg/L.

10.5 Soil Vapour Field Observations

The first soil vapour sampling event was undertaken on 17 April 2018. The sampling event comprised installation of seven new sub-slab soil vapour probes. The soil vapour probes were installed and sampled in accordance with the methodology presented in **Section 7.5**. An example sub-slab soil vapour probe installation diagram is presented in **Appendix F**, alongside soil borehole and groundwater monitoring well logs. Installation details are also provided in **Appendix F**.

The soil vapour sampling event was conducted during a low-pressure system. The recorded weather conditions are presented in **Appendix L**. Over the period of sampling, a decrease in ambient temperature was noted to coincide with a south/south-easterly wind.

The second soil vapour sampling event was undertaken on 15 November 2018. The sampling event comprised the sampling of two off site soil vapour wells (SV18 and SV19) on the northern side of Henry Street. The soil vapour wells were installed between 4.7 and 5.0 m bgs. Installation details are provided in **Appendix F**.

A multi-gas meter was utilised to conduct leak tests at an approximate rate of 300 mL/minute. Sampling of the probes was undertaken by low-flow air pump method, calibrated to 100 mL/minute, and sampled for a period of one hour (total volume 6 L).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

10.6 Soil Vapour Analytical Results

Detailed laboratory reports and chain of custody documentation are provided in **Appendix H**. Summarised soil analytical data for COPCs are presented in **Table C**. Concentrations of contaminants within soil vapour were converted from total mass values provided within laboratory documentation via the application of conversion factor as shown below.

$$Concentration\ in\ \frac{mg}{m^3} = \frac{laboratory\ result\ (in\ \mu g)}{(6\ or\ 24)\ L\ sample\ volume}$$

Concentrations of VOCs were generally reported to be below the laboratory LOR and the relevant site assessment criteria. The following chlorinated solvents were reported to have been detected within the carbon media at masses which correspond to vapour concentrations in exceedance of the site assessment criteria for sub-slab locations on the site:

- PCE was detected in SV14 at a mass of 1000 µg within the carbon medium, corresponding to a soil vapour concentration of 42 mg/m^3 (HIL-A, HIL-B and HIL-C); and
- TCE was detected in SV14 at a mass of 69 µg within the carbon medium, corresponding to a soil vapour concentration of 2.88 mg/m^3 (HIL-B, HIL-C and HIL-D);
- TCE was detected in SV16 at a mass of 4.2 µg corresponding to a soil vapour concentration of 0.168 mg/m^3 (HIL-B and HIL-D); and
- In addition to the above, PCE was detected in SV11 and SV16 at masses of 4 µg and 38 µg, corresponding to soil vapour concentrations of 0.17 mg/m^{3}and 1.58 mg/m^3.

Offsite soil-vapour wells sampled (SV18 and SV19) were reported to be generally absent VOCs, with the notable exception of the following:

- PCE was detected in SV18 (367 mg/m^3) and SV19 (1300 mg/m^3), exceeding the HIL-B, HIL-C and HIL-D criteria by one to two orders of magnitude; and
- TCE was detected in SV18 (1.62 mg/m^3) and SV19 (8.83 mg/m^3), exceeding the HIL-B, HIL-C and HIL-D criteria by one to two orders of magnitude.

Trace detections of the following compounds were also detected within SV18 and SV19:

- Chloroform was detected in SV18 (0.28 mg/m^3) and SV19 (0.33 mg/m^3);
- Toluene was detected in sample SV18 (0.167 mg/m^3), less than the adopted HSL-D criteria (NEPC 2013); and
- Xylene was detected in sample SV18 (0.417 mg/m^3), less than the adopted HSL-D criteria (NEPC 2013).

10.7 Indoor Air Observations

Indoor air sampling events were undertaken on 9, 17 April, 3 May and 15 November 2018. The sampling events comprised collection of indoor air samples from locations shown on **Figure 4D.** On 9 and 17 April 2018, samples were taken from four locations: DC_SHOP, DC_BATH, 140_SHOP and 140_BATH. An additional sample was collected from 140_SHOP on 3 May 2018. A background sample was taken from location 'Ambient Outside' on 17 April 2018. On 15 November 2018, samples were collected from two locations: 2/134_SHOP, 140_SHOP_2. An additional sample was also collected at location 140_SHOP. Descriptions of the locations are provided as follows:

- DC_SHOP: upon a shelf within the general shop floor of Shop 3/134-138 Henry Street;
- DC_BATH: ground surface level of an enclosed water closet, connected to sewerage infrastructure of Shop 3/134-138 Henry Street;
- 140_SHOP: upon a shelf within Shop 3/140 Henry Street;

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- 140_BATH: ground surface level of an enclosed water closet, connected to sewerage infrastructure of Shop 3/140 Henry Street;
- 140_SHOP_2: upon a shelf within the massage room of Shop 3/140 Henry Street;
- 2/134_SHOP: upon a shelf within the café located at Shop 1 138/134 Henry Street; and
- Ambient Outside: ground surface level of a secured, outside area adjacent to Shop 3/134-138 Henry Street.

The recorded weather conditions, in addition to graphed temperature and pressure differentials, are presented in **Appendix L**. The indoor air sampling events were conducted during the following atmospheric conditions:

- 9 April 2018: Hot conditions/large pressure differential. During the sampling period, it was noted that both premises assessed were being cooled with air conditioning units;
- 17 April 2018: Representative conditions. It is noted that this sampling event was meant to coincide with a large pressure differential, which is usually indicated by a predicted southerly wind. The reported pressure differential was not representative of 'worst-case' conditions; and
- 3 May 2018: Hot conditions/large pressure differential. During the sampling period, it was noted that both premises assessed were being cooled with air conditioning units.
- 15 November 2018: Hot conditions/large pressure differential. During the sampling period it is noted that a large storm front formed in the second half of the day.

10.8 Indoor Air Analytical Results

Detailed laboratory reports and chain of custody documentation are provided in **Appendix H**. Summarised soil analytical data for COPCs are presented in **Table D**. Indoor air concentrations were generally noted to be below the adopted site investigation criteria, with the exception of TCE in sample 140_SHOP (9 April 2018). TCE was reported at a concentration of 20 µg/m^3, exceeding the adopted site investigation criterion.

A statistical analysis of the data set was undertaken, which comprised calculation of an average TCE in indoor air concentration across the three sampling events at 140_SHOP. Utilising a value of half the laboratory LOR where the no detection above LOR was reported, the average value for TCE within at this location is 6.93 µg/m^3, which is below the adopted site investigation criterion.

However as discussed further in **Sections 11.1.4** and **12**, it is not considered that the high level of TCE reported is consequent of sub-surface impact at the site, and the slight exceedance as based on this spurious result is not a sufficient basis to warrant intervention and/or management actions in the near term.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

11. Contaminant Distribution Summary

Based on information collected in the desktop and field investigations in conjunction with laboratory analytical data, the distribution of contaminants is discussed in **Section 11.1** to **Section 11.3**.

11.1 AEC 1 Former Dry Cleaner

Soil, soil vapour and groundwater samples obtained during the DSI (JBS&G 2017a) and the current investigation indicate that the greatest levels of chlorinated ethene impact is in the immediate vicinity 134-138 Henry Street and extending north and west of the premises. Detections of contaminant concentrations a considerable distance west of the premises provide evidence that the compounds may have migrated along the inferred sewerage infrastructure alignment. Impacts to site media are detailed in **Section 11.1.1** to **Section 11.1.3**

11.1.1 Soil Impacts

Soil samples analysed as part of the previous (JBS&G 2017a) and the current investigation have not identified gross and/or widespread soil contamination. No soil samples analysed within the groundwater table, or nearby to sewerage infrastructure were reported to contain COPCs above the laboratory limit of reporting. Minor concentrations of PCE and TCE at location JHA04, underlying Shop 3/140 Henry Street, were reported in JBS&G (2017a).

Notwithstanding, it is considered likely that soils surrounding the sewerage infrastructure, and underlying the dry cleaner, have historically been impacted by dry cleaning solvents. The maximum levels of TCE reported in sub slab vapour are consistent with a source of chlorinated ethene being present in the unsaturated zone. Chlorinated ethenes can commonly be heterogeneously distributed through a soil profile, and localised within the extent of a sample of soil collected in clay based soils. Due to their complex partitioning characteristics subsurface chlorinated ethene impacted soils are not typically readily identified. Impacted soils are considered to potentially represent an ongoing source of contamination to both groundwater and soil vapour.

11.1.2 Groundwater Impacts

Groundwater analytical results indicated that PCE was present at concentrations exceeding the investigation criterion at JBMW02 and JBMW05, and above the laboratory limit of reporting in JBMW03, PSM01 and PSM03. Chlorinated ethenes were not detected in samples of groundwater collected from JBMW01, JBMW04, JBMW06, JBMW07 or PSM02. . Trace concentrations of TCE in groundwater were reported at locations JBMW02 (0.002 mg/L to 0.009 mg/L), JBMW05 (0.002 mg/L) and PSM01 (0.001 mg/L).

It is noted that JBMW02 and JBMW05 are over the northern boundary of the site, providing evidence that the impact has migrated off the site via the groundwater. No groundwater monitoring wells have been installed directly into the chlorinated ethene impact source zone, although it is considered likely that the highest concentrations of chlorinated ethenes will be present directly underneath the dry cleaner.

Impacts to groundwater have been delineated north (JBMW06 and JBMW07), east (JBMW03), south (PSM02) and west (JBMW01 and JBMW04). Potential remains for groundwater impact to be present further northwest of JBMW05.

11.1.3 Soil vapour Impacts

<u>Shallow Soil Vapour</u>

Results obtained from the current investigation have shown that significant concentrations of PCE and TCE are present within shallow soil vapour (<0.3 m bgl) surrounding the dry cleaner. Soil vapour contaminant samples collected from locations SV11, SV14 and SV16 were reported to have concentrations of CEs above the laboratory limit of reporting. The highest results reported during the current assessment were associated with location SV14, which was placed immediately overlying

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

sewerage infrastructure servicing the dry cleaner. Soil vapour samples collected from locations SV12, SV13, SV15 and SV17 were not reported to have any VOCs above the laboratory limit of reporting.

Within samples where both TCE and PCE were detected above the laboratory LOR, the ratio of PCE/TCE ranged from 4.143 to 14.49.

The distribution of CEs in soil vapour has provided evidence that the compounds have migrated within/alongside the sewerage infrastructure a considerable distance from the dry cleaner (>50 m). In addition, impacted soil vapour may be migrating over the northern boundary of the site, as indicated by elevated concentrations in SV11.

The investigation results indicate that the occurrence of CEs in shallow soil-vapour is not strongly correlated with presence in groundwater. Whilst volatilisation of CEs from groundwater is likely to be occurring, it is considered unlikely that it is occurring at a level which represents a risk to future site users on the basis of the following considerations.

- SV09 contained no soil vapour concentrations above the laboratory LOR with elevated underlying groundwater impact (PSM01, 0.033 mg/L to 0.059 mg/L);
- The largest groundwater impact (JBMW02) was near two soil-vapour sample locations which were reported to contain minimal concentrations (SV11) to no detection (SV12) of CEs in soil-vapour were present;
- SV16 contained elevated concentrations of CEs with no underlying groundwater impact (JBMW04), and the highest reported soil vapour impact is overlying adjacent to the sewerage infrastructure (SV14); and
- Groundwater is in excess of 7 m below the current ground surface.

Deep Soil Vapour

Two deep soil vapour samples were taken north of the former dry cleaner (SV18 and SV19). Samples were collected from 4.7 m to 5.0 m below ground levels. Highly elevated CEs were detected in both samples, exceeding interim HILs:

- SV18: PCE (367 mg/m^3) and TCE 1.62 (mg/m^3); and
- SV19: PCE (1300 mg/m^3) and TCE 8.83 (mg/m^3).

These results are indicative of the presence of contamination at beneath/adjacent to the former dry cleaners at depth. The relatively low concentrations in groundwater indicate that the deep source is unlikely to be present in the saturated zone. Additional assessment will be required to determine whether offsite soil-vapour impacts require specific consideration as part of remediation of the PCPV site.

11.1.4 Indoor Air

Indoor air was sampled over four monitoring events (9 and 17 April 2018, 3 May 2018 and 15 November 2018). Samples analysed from Shop 3/134-138 Henry Street and Shop 3/140 Henry Street have indicated that the PCE is present within the indoor air of both premises. TCE was generally not detected above the laboratory limit of reporting in the analysed samples, with the notable exception of 140_SHOP on 9 April and 3 May 2018. **Table 11.1** and **Table 11.2** show ratios of indoor air to sub-slab vapour concentrations, and relative PCE to TCE concentrations within samples.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 11.1 Indoor Air and Sub-Slab VOC Concentrations

Sample Location	Highest Indoor Air Concentration (µg/m³)	Closest Sub-Slab Soil Vapour Concentration (µg/m³)	Indoor Air to Sub-slab Soil Vapour Ratio
Tetrachloroethene			
140_BATH	<3	14 500 (SV10)	<0.00021
140_SHOP	5	14 500 (SV10)	0.00035
DC_BATH	8	40 000 (SV14)	0.00020
DC_SHOP	8	40 000 (SV14)	0.00020
Trichloroethene			
140_BATH	<2.7	3500 (SV10)	<0.00077
140_SHOP	20	3500 (SV10)	0.00571
DC_BATH	<2.7	2760 (SV14)	<0.00098
DC_SHOP	<2.7	2760 (SV14)	<0.00098

Table 11.2 PCE to TCE Ratio in Site Media

Sample Location	Highest PCE Concentration (µg/m³)	Highest TCE Concentration (µg/m³)	Ratio of PCE/TCE	Approximate Distance From Shop 3/140 Henry Street / Distance From Shop 3/134-138 Henry Street (m)
Indoor Air				
140_BATH	<3	<2.7	-	Internal
140_SHOP	5	20	0.250	Internal
DC_BATH	8	<2.7	>2.963	Internal
DC_SHOP	8	<2.7	>2.963	Internal
Sub-Slab				
SV05	56 667	9333	6.072	<5 / 20
SV10	14 500	3500	4.143	Underlying / 15
SV14	40 000	2760	14.49	Boundary / < 5
SV16	1520	168	9.047	30 / 40

One reported concentration of TCE within indoor air sample 140_SHOP, 9 April 2018 (20 µg/m³), was inconsistent with the subsequent three samples taken at the same location, 17 April 2018 (<2.7 µg/m3),3 May 2018 (5 µg/m³) and 15 November 2018 (<2.7 µg/m³).

The ratio between TCE and PCE in this indoor sample was significantly different to all sub-slab soil vapour samples in which both TCE and PCE were detected. On this basis, the elevated concentration is considered likely to be the result of an additional, internal source within the premises, and is not considered to be reflective of CE advection from the sub-slab soil vapour.

11.2 AEC 2 Former Service Station

Environmental media samples analysed as part of the previous (JBS&G 2017a) and the current investigations have provided evidence that gross and/or widespread contamination as a result of the former service station operation has not occurred.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Soil samples analysed from JBMW03, JHA04 and JHA06 were reported to have concentrations of TRHs below the adopted site investigation criteria. Soil vapour samples analysed from four locations surrounding the premises were reported to have concentrations of TRHs and BTEX compounds below the laboratory LOR or the site investigation criteria. No TRHs, PAHs or lead in groundwater above the laboratory LOR were reported at JBMW03. If any impacts to soil, groundwater or soil vapour have occurred as a result of the operation of the former service station, it is considered likely that they will be limited to minor, localised hotspots.

11.3 Additional Contamination Issues

Additional known and potential contamination issues identified are detailed in **Section 11.3.1** to **Section 11.3.3**.

11.3.1 Soil Impacts

Minor impacts to soils have previously been identified (JBS&G 2017a): elevated nickel, lead and TRHs in fill material. With consideration of soil analytical data obtained in the current assessment, total soil contaminant concentrations reported in JBS&G (2017a) are not considered to represent statistically significant exceedances of the site investigation criteria. The potential for leachability of lead from fill material at JHA02 is discussed in **Section 12.5.**

With the exception of the above, and impacts discussed in **Section 11.1.1**, soils at the site are considered to be generally free from contamination. No odours, staining or asbestos were observed in any of the historical or current investigation locations. It is noted that the character of soils underlying existing building footprints, and underlying the four onsite transformers, has not yet been determined. Additionally, given the limitation of soil investigations via boreholes, there is the potential for asbestos impacts to be present within soils that have not yet been identified.

11.3.2 Groundwater Impacts

JBS&G (2017a) reported elevated concentrations TRHs in PSM01, PSM02 and PSM03, as well as elevated toluene in PSM01. Analytical results from the current investigation have indicated that these compounds were either not detected above the laboratory LOR or detected at substantially lower concentrations. It is considered that these compounds may have been associated with drilling advancement fluids employed as part of the geotechnical drilling methodology utilised for the installation of these wells, rather than be present with in the local groundwater system beyond the monitoring well.

Analysis of heavy metals within JBMW03 has identified arsenic and nickel at concentrations exceeding the adopted site criteria. The potential risks associated with elevated metals in JBMW03 are discussed in **Section 12.5**.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

12. Discussion

Based on the decision-making process established in **Section 7.1.2**, the decisions required to be made are discussed below. The discussion has been split between current site users under an ongoing commercial/industrial land use, as identified during the site investigation, and the future land use under the future Penrith City Park proposal.

12.1 Potential Risks to Future Onsite Receptors

The potential risk to current and future site users posed by site media is discussed in **Section 12.1.1** to **12.1.3** below**.**

12.1.1 Soils

No statistically significant exceedances of the commercial/industrial site investigation criteria for COPC concentrations in soil were reported in any of the analysed samples. Chlorinated ethene impacts are considered likely to exist within soils surrounding sewerage infrastructure and in the vicinity of the dry cleaner. Risks to future site users as a result of the presence of soil-bound CEs are discussed in **Section 12.1.2** and **12.1.3.**

Notwithstanding, the potential remains that minor/localised impacts exist underlying the building located at 118 Henry Street (The Service Station, AEC 2), near onsite electrical transformers (AEC 3) and within shallow fill material across the site. Whilst hardstand surfaces are maintained at the site, the potential presence of unidentified ACM in shallow fill material is considered not to represent a substantial risk to site users. Consideration of these potential impacts should be made prior to any site maintenance/redevelopment activities which may result in disturbance of soils within these AECs, as discussed in **Section 12.6**.

12.1.2 Groundwater

Groundwater at the site is impacted by VOCs (primarily PCE and TCE) and heavy metals (primarily arsenic and nickel). Given the absence of identified groundwater bores, aesthetic concerns noted in **Section 12.4**, and the salinity of the groundwater, no potential for utilisation of site groundwater as a drinking water source exists or is expected to exist at the site. In addition, no onsite ecological receptors of groundwater impacts currently exist at the site. A discussion of potential risks to offsite groundwater receptors is provided in **Section 12.5**.

On this basis, exceedances of the NHMRC (2017) drinking water criteria and the ANZAST (2018)disturbed ecosystem criteria do not warrant further consideration pertaining to the assessment of risks to future/current site receptors. Potential beneficial reuse of groundwater will be considered within the site management strategy.

12.1.3 Soil Vapour

Comparison of sub-slab soil vapour VOC concentrations with the adopted site investigation criteria indicate that there is a potential risk to site users within the buildings located at 134-138 (The dry cleaner) and 140 Henry Street, Penrith. Additionally, a sub-slab soil-vapour concentration in exceedance of the site assessment criteria was reported at location SV16, overlying sewerage infrastructure at the rear of 144 Henry Street Schedule B(7) of the NEPM (NEPC 2013) notes that the interim soil vapour HILs derived for VOCs under a commercial/industrial land use scenario are conservatively based on a sub-slab to indoor air attenuation factor of 0.1 and do not account for factors such as contaminant sorption, transformation and degradation. Further, JBS&G assessment of sub-slab to indoor air attenuation to other buildings within the Sydney metropolitan region for these constituents has demonstrated that the factor of 0.1 is highly conservative.

It is noted that trace detections of chloroform at 4.7-5.0 m bgs were reported at SV18 and SV19. In the absence of any EPA endorsed criteria for screening level criteria for chloroform in soil-vapour, JBS&G made a qualitative assessment on potential risks to site users. Based on the depth to the

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

location of the identified chloroform, absence from surface level soil vapour and absence from indoor air samples across the site, these detections are considered unlikely to represent a potential risk to current/future site users.

Consistent with NEPC (2013), indoor air sampling is the most direct approach for the quantification of inhalation exposure for VOCs. Significant limitations are stated within NEPC (2013) pertaining to the process of derivation for the sub-slab Interim VOCC HILs. As such, indoor air concentrations for these compounds are more appropriate for consideration of risks to current site users. On this basis, determination of risks posed to current site users at the premises due to the presence of COPCs in sub-slab soil vapour was based on the results of the indoor air assessment only as discussed in **Section 12.1.4**.

Sub-slab soil vapour VOC concentrations were further compared against site investigation criteria for the proposed land uses under the Penrith City Park development. Comparison of concentration data indicated that COPCs were generally present at concentrations significantly below the site investigation criteria, apart from impact at locations SV05 and SV14. Concentrations of PCE and TCE were reported in soil-vapour in exceedance of the HIL-C VOCC site investigation criteria. A potential risk to future site users exists within this portion of the proposed Penrith City Park development.

The PCPV development may potentially include multi-level basements within the high-density residential/commercial areas (**Figure 2**). Assessment of shallow soil-vapour surrounding 118 Henry Street indicates that there are no vapours present within shallow soils of the future high density residential/commercial areas. However, the potential remains for soil-vapour impact to be present at depth at concentrations which may represent a risk to occupants of future basements if not appropriately managed.

Where multi-level basements are proposed, confirmation that soil-vapour impacts are absent over the depth profile will be required to determine that no risks are present to future basement occupants.

12.1.4 Indoor Air Assessment

Review of indoor air analytical data from the premises located at 134-138 and 140 Henry Street has indicated that, whilst soil-vapour COPCs are present at concentrations which exceeded interim HIL-D VOC site assessment criteria, the contaminants are not migrating into the indoor air environment at a rate resulting in risks to the site occupants.

It is noted that a concentration of TCE reported at 140_SHOP varied significantly, with one reported concentration exceeding the site investigation criterion. Three repeat samples returned values less than the site investigation criterion, and generally less than the laboratory limit of reporting. It is considered likely that the elevated concentration is attributable to an onsite/indoor source which wasn't able to be located during the site inspection.

Where this peak level was consequent of a sub-surface soil vapour source, it would have been reasonably anticipated that PCE would have occurred with the TCE in the indoor air sample. PCE has been reported at higher concentrations than TCE in the all impacted soil vapour samples. PCE has reasonably similar chemical properties to TCE which would indicate it would be as likely to occur within indoor air. The absence of a significant level of PCE in the most impacted indoor air concentration is strongly indicative of an indoor (non-site contamination) related source of TCE being present within the building which has interfered with the sample.

Consistent with NEPC (2013), indoor air concentrations measured may be affected by temporal and spatial variability and background sources. On this basis, and given the identified exceedance of the adopted site investigation criterion, to determine the potential for risk for current site users within Shop 3/140 Henry Street, additional indoor air monitoring should be undertaken.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

12.2 Background Soil Contamination

Metals concentrations within natural soil samples analysed were within published background ranges as detailed in **Section 6.2.1**.

12.3 Chemical Mixtures

Soil vapour samples analysed at locations SV04, SV05, SV10, SV11, SV14, SV16, SV18 and SV19 were reported to have concentrations of both PCE and TCE above the adopted site assessment criteria. The exposure pathway (inhalation) and physiological effects of these contaminants is similar and this may have compounding detrimental effects to the health of future site users. However, it is generally accepted that there is sufficient conservatism in the assessment criteria presented to account for potential effects of chemical mixtures particularly for contaminants that commonly occur together.

There were no soil or groundwater samples analysed which indicated the presence of a chemical mixture requiring further consideration.

12.4 Aesthetic Issues

No visible ACM, odours, stains or other sources of aesthetic concern under the current or proposed land uses were observed during the soil or soil vapour investigation.

12.5 Potential Offsite Migration of Contaminants

The potential for offsite migration of VOCs was assessed via sampling/analysis of boundary groundwater monitoring wells and temporary sub-slab soil vapour probes. Additionally, offsite migration of impact was assessed via installation and sampling of downgradient soil vapour and groundwater monitoring wells.

Identification of significant concentrations of VOCs in offsite vapour and groundwater wells has indicated that offsite migration of contamination from the site has occurred.

The sewerage infrastructure on the site has been identified to present a preferential pathway for VOCs. Given analytical data for soil vapour concentrations along the service line infrastructure were below the adopted site investigation criteria, it is considered unlikely that offsite migration via the sewerage infrastructure is occurring at a level requiring further consideration. Notwithstanding, the potential for offsite migration via sewerage infrastructure is required to be addressed as part of the site management strategy.

As discussed in **Section 11.1.1**, it is considered likely that soils underlying the dry cleaner and soils nearby to impacted sewerage infrastructure represent an ongoing source of contamination to groundwater and soil vapour at the site. Currently, this area is almost completely capped by hardstand pavements and/or building footprints which limit the extent of surface and rainwater infiltration. It is understood that the proposed redevelopment will comprise demolition of existing hardstand pavements and site structures, exposing previously capped materials to rainwater infiltration. On this basis, management of these soils is required, as discussed in **Section 12.6**.

JBS&G considers remedial works are required to make the site suitable for the intended purpose and, as such, all ongoing sources of contamination to that pose a potential risk to offsite receptors will be removed from the site.

12.5.1 Groundwater

Groundwater impacts were identified in two samples obtained from offsite monitoring wells (JBMW02 and JBMW05) marginally in exceedance of ANZAST (2018) and NHRMC (2011) assessment criteria confirming that groundwater impact has migrated from the site in a north-westerly direction.

No positive detections of VOCs were reported in samples obtained from wells to the north of the site (JBMW06 and JBMW07) or to the west of the dry cleaner (JBMW01 and JBMW04). A trace level

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

detection of PCE was reported in JBMW03. The absence of significant groundwater within these samples indicates that impacted groundwater migration is limited to the northwest of the dry cleaner, consistent with the inferred groundwater flow direction (**Section 10.3**). The north-westerly extent of the groundwater plume is not currently known.

The highest reported chlorinated ethene concentration (JBMW02, 0.15 mg/L) is approximately two times the ANZAST (2018) criterion for 95 % protection of fresh water aquatic species. Trace concentrations of VOCs for which no freshwater aquatic criteria are available were also detected at JBMW02. The VOCs reported in offsite groundwater are unlikely to pose an ecological risk to the identified receptor as significant attenuation dilution occurs between the site and the river (noting that the groundwater fluid electrical conductivity/total dissolved solids is approximately an order of magnitude higher than occurs in the Nepean River at Penrith). On this basis, potential risks to sensitive offsite groundwater receptors are not considered significant. Further, given the contaminating land use has now ceased, it is anticipated that offsite groundwater concentrations will diminish over time via natural attenuation processes.

12.5.2 Soil Vapour

No exceedances of the site assessment criteria for VOCs in soil vapour were identified within sub-slab samples on the northern boundary of the site (SV11, SV12 and SV13). Positive detections of PCE were reported within the soil vapour at location SV11, albeit substantially below the site assessment criteria, indicating that contaminated vapour has migrated over the northern boundary in shallow soils and is present within soil vapour, but does not represent a risk to offsite receptors on the ground surface and/or construction workers who may require to access shallow services.

Deep soil vapour probes installed beyond the northern site boundary (**Figure 4C**), SV18 and SV19 were reported to contain highly elevated concentrations of PCE and TCE. Given the proximity of these sample locations to the basement of 121 Henry Street, a potential vapour intrusion pathway was identified which has been further assessed in JBS&G (2019).

The soil-vapour impact at depth indicates the presence of a deep source of chlorinated ethenes at/or adjacent to the site. The low concentrations reported in groundwater indicate that significant source is not present in the saturated zone.

12.6 Site Management Strategy

Based on the proposed land use, the scope of work completed for this assessment and the limitations presented in **Section 11**, there are considered to be no unacceptable risks to current site users under an ongoing commercial/industrial land use scenario. With respect to the risks posed to future site users under the proposed Penrith City Park land uses, elevated concentrations of VOCs in soil-vapour represent a potentially unacceptable risk. In addition, offsite migration of VOCs is currently occurring over the northern site boundary. A site management strategy will be required to address these issues. The following management actions should be undertaken:

- An interim environmental monitoring plan (EMP) should be prepared for the site. The EMP should specify requirements for ongoing monitoring of indoor air in Shop 3/140 Henry Street and specify action-response protocols in the event that elevated concentrations of CEs are identified. Additionally, the EMP should guide any site maintenance activities which involve disturbance of soils underlying hardstand pavements or building footprints across the site. The interim EMP should make specific reference to, and specify worker controls for, impacted soils/soil-vapour underlying 134-138 and 140 Henry Street as well as potential asbestos containing material in shallow soils across the site. The plan should further control potential beneficial uses of groundwater in the period preceding site remediation;
- A Remedial Action Plan (RAP) is be required to be prepared to identify the preferred remedial methodology. The RAP should identify outstanding data gaps pertaining to soils underlying existing building footprints, potential deep soil-vapour impact sources and

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

underlying the four onsite transformers at the site. The RAP is required to be enacted prior to any site redevelopment activities and should specify controls to reduce the potential for contaminant migration as a result of demolition of hardstand pavements/site structures.

Additionally, site management controls including protocols to manage unexpected finds should be included in the interim EMP and the RAP and implemented during any ground disturbance works associated with site maintenance or development.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

13. Conclusions and Recommendations

In accordance with the limitations in **Section 14**, the following conclusions are provided:

- Whilst not positively identified as part of this DGI, the potential remains for USTs to be present within the former service station at 118 Henry Street;
- Historical service station operations at 118 Henry Street have not resulted in gross/widespread contamination of site media. Localised, minor contamination hotspots may exist underlying the existing building footprint;
- Historical chlorinated solvent contamination at 134-138 Henry Street has resulted in contamination of site soils, groundwater and soil-vapour at the site;
- Cessation of dry-cleaning operations has resulted in removal of the primary VOC contamination source. Soils nearby to and underlying sewerage infrastructure servicing 134-138 and 140 Henry Street are considered likely to represent an ongoing secondary source of contamination to groundwater and soil-vapour;
- VOC impacted media at the site is localised to the vicinity of the former dry-cleaner. Impacted soil vapour and groundwater are migrating over the northern boundary of the site. The extent of impacted groundwater plume migrating northwest of JBMW05 has not been delineated;
- Results of indoor ambient air sampling undertaken at Shop 3/140 Henry Street have been variable, exceeding the adopted site investigation criterion in one round. On this basis, additional indoor air monitoring is required to determine whether contamination of onsite media represents a risk to current site users;
- An assessment of vapour intrusion potential undertaken within the basement at 121 Henry Street, Penrith has determined that, whilst highly elevated soil-vapour concentrations exist on the boundary of the Council property (Henry Road), no significant vapour intrusion into the basement is occurring;
- With consideration of the proposed general development scenario, potential risks to future site users. On this basis, the site will require remediation prior to, or concurrent with, site redevelopment activities; and
- Based on the results of the completed investigations completed it is considered that the site is able to be made suitable for the proposed future land uses subject to implementation of a RAP.

The following recommendations are provided:

- Further groundwater and deep soil vapour assessment works are required the northwest of JBMW05 to provide a boundary to the plume extent.
- An interim EMP should be prepared for the site and should include ongoing monitoring of indoor air at Shop 3/140 Henry Street. In addition, the EMP should guide maintenance/construction activities which have the potential to involve disturbance of soils underlying current hardstands or building footprints and to control potential beneficial use of groundwater; and
- To address potential risks to future site users and potential risks to offsite receptors beyond the northern boundary, an RAP is required to be produced. The RAP should address existing data gaps pertaining to soils underlying existing buildings, offsite soil vapour impacts and the preferred remedial strategy for the site.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

14. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the Site history. Further chemicals or categories of chemicals may exist at the Site, which were not identified in the Site history and which may not be expected at the Site.

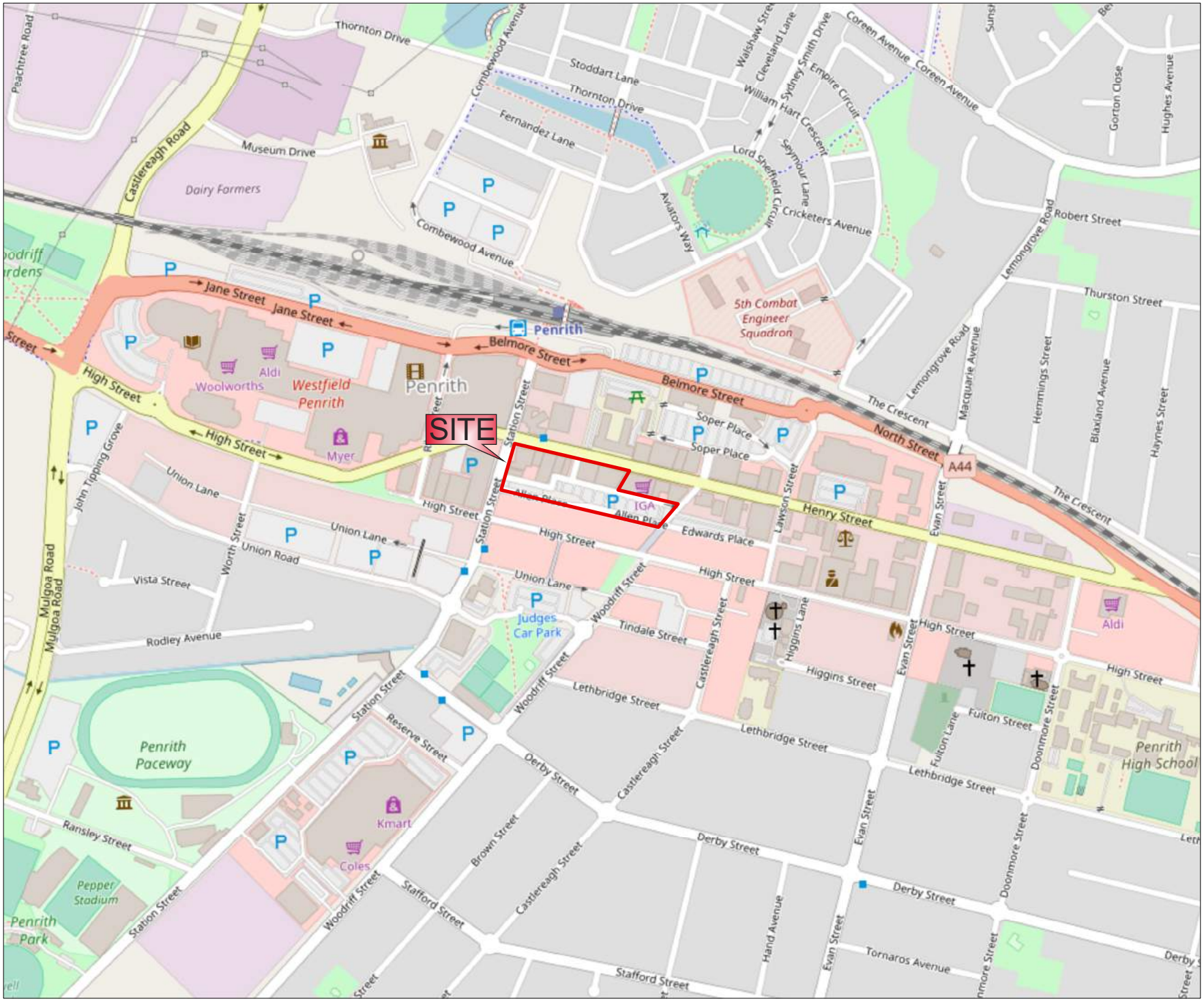
Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the Site, and it is limited to the scope defined herein. Should information become available regarding conditions at the Site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figures

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021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Penrith
Penrith

ID	Easting	Northing
A	286549.96	6262960.11
B	286738.64	6262915.51
C	286719.88	6262884.07
D	286817.91	6262860.38
E	286785.66	6262822.43
F	286527.10	6262883.70

Reference: Near Map www.nearmap.com, imagery date 20-01-2018

Legend:

- Approximate Site Boundary
- Approximate Lot Boundary
- Dry Cleaners Location
- Former Service Station Location
- Proposed Building Development Site
- Proposed Green Space
- Transformer

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R04 Rev 0	Date: 27-Apr-2018
Drawn By: BC	Checked By: RH

Scale 1:1,500

0 10 20
metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

SITE LAYOUT AND CADASTRAL BOUNDARIES

FIGURE 2

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Approximate Site Boundary
- Sewerage Infrastructure / Preferential Pathway
- Approximate Lot Boundary
- AEC 1- Dry Cleaners Location
- AEC 2- Former Service Station Location

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R04 Rev 0	Date: 27-Apr-2018
Drawn By: AV	Checked By: RH

Scale 1:1,000

0 10 20
metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

AREAS OF ENVIRONMENTAL CONCERN AND POTENTIAL PREFERENTIAL PATHWAYS

FIGURE 3

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Approximate Site Boundary
- Approximate Lot Boundary

Sample Location

- PSM Groundwater Monitoring Well
- JBS&G Groundwater Monitoring Well
- JBS&G Borehole
- JBS&G Hand Auger

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R04 Rev 0	Date: 09-Jul-2018
Drawn By: BC	Checked By: RH

Scale 1:1,500

0 20 40

metres

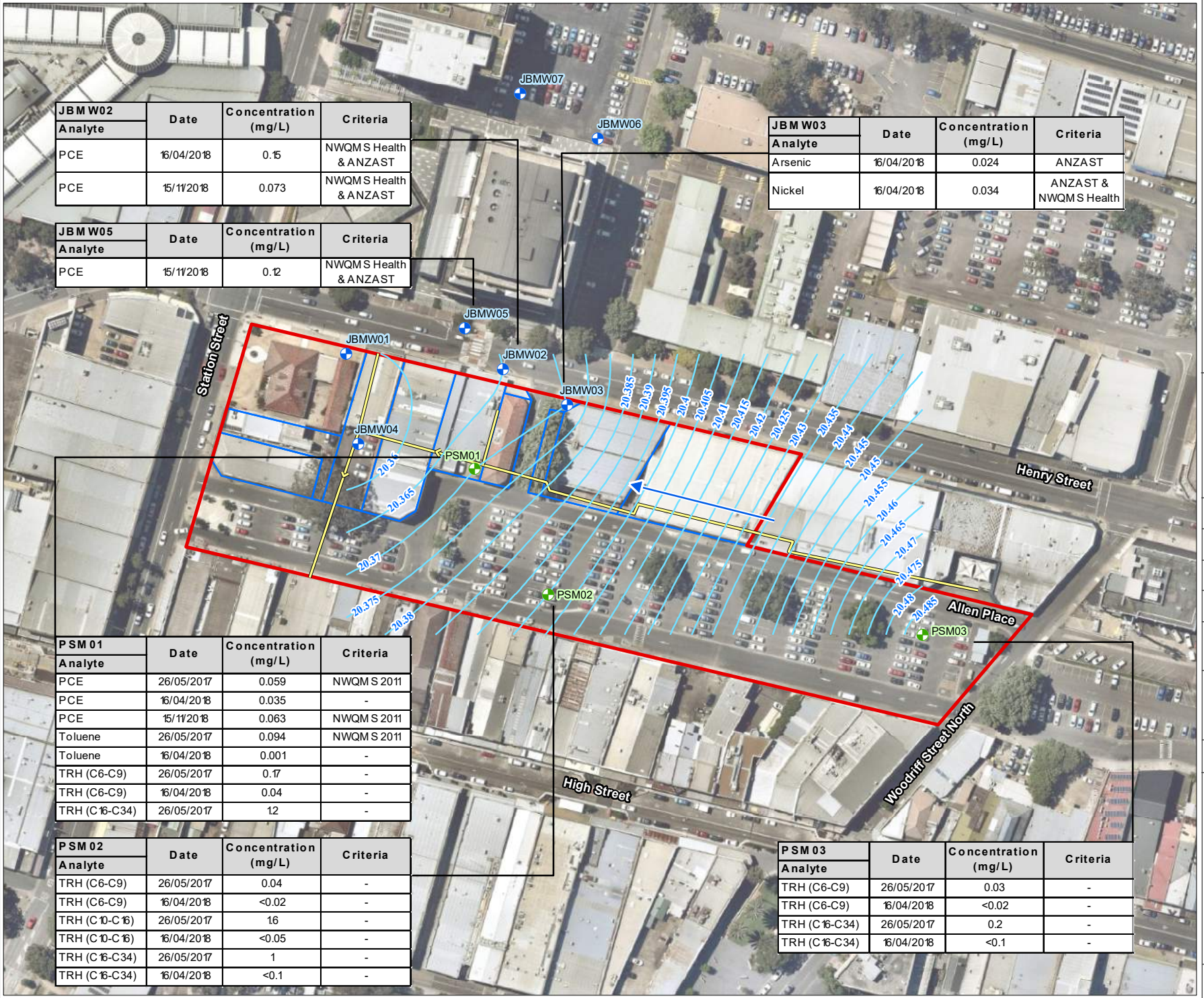
Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

SOIL NVESTIGATION LOCATIONS & SOIL CRITERIA EXCEEDANCES

FIGURE 4A

Reference: Near Map www.nearmap.com, imagery date 20-01-2018
Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



JBMW02 Analyte	Date	Concentration (mg/L)	Criteria
PCE	16/04/2018	0.15	NWQMS Health & ANZAST
PCE	15/11/2018	0.073	NWQMS Health & ANZAST

JBMW05 Analyte	Date	Concentration (mg/L)	Criteria
PCE	15/11/2018	0.12	NWQMS Health & ANZAST

JBMW03 Analyte	Date	Concentration (mg/L)	Criteria
Arsenic	16/04/2018	0.024	ANZAST
Nickel	16/04/2018	0.034	ANZAST & NWQMS Health

PSM01 Analyte	Date	Concentration (mg/L)	Criteria
PCE	26/05/2017	0.059	NWQMS 2011
PCE	16/04/2018	0.035	-
PCE	15/11/2018	0.063	NWQMS 2011
Toluene	26/05/2017	0.094	NWQMS 2011
Toluene	16/04/2018	0.001	-
TRH (C6-C9)	26/05/2017	0.17	-
TRH (C6-C9)	16/04/2018	0.04	-
TRH (C16-C34)	26/05/2017	1.2	-

PSM02 Analyte	Date	Concentration (mg/L)	Criteria
TRH (C6-C9)	26/05/2017	0.04	-
TRH (C6-C9)	16/04/2018	<0.02	-
TRH (C10-C16)	26/05/2017	1.6	-
TRH (C10-C16)	16/04/2018	<0.05	-
TRH (C16-C34)	26/05/2017	1	-
TRH (C16-C34)	16/04/2018	<0.1	-

PSM03 Analyte	Date	Concentration (mg/L)	Criteria
TRH (C6-C9)	26/05/2017	0.03	-
TRH (C6-C9)	16/04/2018	<0.02	-
TRH (C16-C34)	26/05/2017	0.2	-
TRH (C16-C34)	16/04/2018	<0.1	-

Reference: Near Map www.nearmap.com, imagery date 30-10-2018

Legend:

- Approximate Site Boundary
- Approximate Lot Boundary
- Sewerage Infrastructure / Preferential Pathway
- Groundwater Contours (m AHD)
- Inferred Groundwater Flow Direction

Sample Location

- PSM Well
- JBS&G Groundwater Monitoring Well

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R04 Rev 2 | Date: 03-Dec-2018

Drawn By: AV | Checked By: RH

Scale 1:1,750

0 20 40

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

GROUNDWATER MONITORING WELL LOCATIONS AND GROUNDWATER CRITERIA EXCEEDANCES

FIGURE 4B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table A(1) - Soil Analytical Data (Health Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

| | Metals & Metalloids | | | | | | | | | | | | | | | | Chlorinated Alkanes | | | | | | | | | | | | | | | |

Table A(1) - Soil Analytical Data (Health Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

| | | |

Table A(1) - Soil Analytical Data (Health Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

| | | |

Table A(1) - Soil Analytical Data (Health Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

Data Comments

#1 ESDAT Combined. Some Analytes are missing from this Combined Compound.
#2 ESDAT Combined with Non-Detect Multiplier of 0.5.
#3 Synthetic mineral fibres detected.
#4 No respirable fibres detected
#5 Organic fibres detected.
#6 ESDAT Combined.
#7 Nil
#8 AF:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table A(2) - Soil Analytical Results (Ecological Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

| | Metals & Metalloids | | | | | | | | | | | | | | | Chlorinated Alkanes | | | | | | | | | | | | | | |

Table A(2) - Soil Analytical Results (Ecological Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

| | | |

Table A(2) - Soil Analytical Results (Ecological Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

| | | |

Table A(2) - Soil Analytical Results (Ecological Criteria)
Project Number: 52372
Project Name: Penrith Central Car Park

#1 ESDAT Combined. Some Analytes are missing from this Combined Compound.
#2 ESDAT Combined with Non-Detect Multiplier of 0.5.
#3 Synthetic mineral fibres detected.
#4 No respirable fibres detected
#5 Organic fibres detected.
#6 ESDAT Combined.
#7 Nil
#8 AF:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table B(1) - Groundwater Analytical Results
Project Number: 52372
Project Name: Penrith Central Car Park

| | | | | Metals & Metalloids | | | | | | | | | Chlorinated Alkanes | | | | | | | | |

Table B(1) - Groundwater Analytical Results
Project Number: 52372
Project Name: Penrith Central Car Park

				Polycyclic Aromatic Hydrocarbons																	Monocyclic Aromatic Hydrocarbons					Miscellaneous Hydrocarbons						Chlorinated Benzenes						Solvents	Organic Sulfur Compounds	Miscellaneous Industrial Chemicals	Dissolved Gases		
				Acenaphthene	Acenaphthylene	Anthracene	Benz[a]anthracene	Benzo[a]pyrene	Benzo[a]pyrene TEQ (WHO)	Benzo[b,j]fluoranthene	Benzo[g,h,i]perylene	Benzo[k]fluoranthene	Chrysene	Dibenz[a,h]anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene	PAHs (Total)	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	Bromobenzene	Isopropylbenzene	Styrene	1,2-dibromoethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromomethane	Dibromomethane	Iodomethane	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	2-Propanone (Acetone)	Carbon disulfide	Hexachlorobutadiene	Ethylene*	Ethane*	Methane
				mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	MG/L	MG/L	MG/L
EQL				0.0001	0.0001	0.0001	0.0001	0.00001		0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.005	0.005	0.05
ANZECC 2000 Fresh Water 95 %						0.00001									0.001			0.016	0.0006													0.16	0.26	0.06									
ADWG 2011 (November 2017) - Aesthetic																								0.004							0.001	0.02	0.003	0.01								
ADWG 2011 (November 2017) - Health								0.00001																0.03	0.001			0.001			1.5		0.04	0.3				0.0007				
ADWG 2011 (as Amended November 2017) (Factor 10) Aesthetics																								0.04							0.01	0.2	0.03	0.1								
ADWG 2011 (as Amended November 2017) (Factor 10) Health								0.0001																0.3	0.01			0.01			15		0.4	3				0.007				
NEPM Groundwater HSL (A&B) for Vapour Intrusion 4 m to 8 m (Clay)																		NL																									
NEPM Groundwater HSL (C) for Vapour Intrusion 4 m to 8 m (Clay)																		NL																									
NEPM Groundwater HSL (D) for Vapour Intrusion 4 m to 8 m (Clay)																		NL																									
US EPA, RSL Region 9, Resident Tap Water x 10					5.3			0.0003				0.025	0.25			2.9	0.0025			1.2		0.56	0.6		4.5			1.2(2)				0.16	0.26	0.06				1.8(2)					
Sample ID	**Sample Date**	**Depth to SWL**	**Lab Report Number**																																								
JBS&G (2017)																																											
PSM01	26/05/2017	6.96	548083	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00014	0.00008	<0.00005	0.00022	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	0.021	<0.001	-	-	-	
QC01_W	26/05/2017	6.96	548083	<0.00005	<0.00005	<0.00005	<0.00005	0.00001	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.0002	0.00005	<0.00005	0.00026	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	0.021	<0.001	-	-	-	
QC01-W/A	26/05/2017	6.96	168063	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	-	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	0[2]	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.01	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	<0.001	-	-	-	
PSM02	26/05/2017	6.95	548083	<0.00005	<0.00005	<0.00005	<0.00005	0.00001	-	0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00014	0.00007	<0.00005	0.00027	0.003	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	<0.001	-	-	-	
PSM03	26/05/2017	8.01	548083	<0.00005	<0.00005	<0.00005	<0.00005	<0.00001	-	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00009	<0.00005	<0.00005	0.00009	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	<0.001	-	-	-	
JBS&G (2018)																																											
JBMW01			545643	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	<0.001	-	-	-	
QA20180416	16/04/2018	7.5	189745	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	-	<0.001	<0.001	-	-	-	
QC20180416			545643	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.005	<0.001	-	-	-	
JBMW02	16/04/2018	7.065	545643	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.005	<0.001	-	-	-	
JBMW02	15/11/2018	7.181	627998	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<1	<0.001	-	<0.1	0.1	0.09	
JBMW03			545643 / 595919	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.005	<0.001	-	-	-	
QA20180416-1	16/04/2018	7.33	189745	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	-	<0.0001	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0002	<0.0001	<0.0001	0[2]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
QC20180416-1			545643	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
JBMW04	16/04/2018	7.14	545643	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.005	<0.001	-	-	-	
JBMW05	15/11/2018	7.167	627998	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<1	<0.001	-	<0.1	0.1	<0.05	
JBMW06	21/11/2018	7.261	628902	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<1	<0.001	-	-	-	-	
JBMW07	21/11/2018	7.275	628902	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<1	<0.001	-	-	-	-	
PSM01	16/04/2018	7.19	545643	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	<0.001	-	-	-	-	
PSM01	15/11/2018	7.259	627998	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<1	<0.001	-	<0.1	<0.1	0.73	
QA151118	15/11/2018	7.259	627998	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<1	<0.001	-	<0.1	<0.1	0.74	
QC15118	15/11/2018	7.259	205736	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	<0.001	<0.01	<0.001	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	<0.005	<0.005	0.78	
PSM02	16/04/2018	7.8	545643	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.012	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	0.01	<0.001	-	-	-	-	
PSM03	16/04/2018	8.31	545643	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.01	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	-	-	<0.001	<0.001	-	-	-	-	

Data Comments

#1 NIL (+)VE
2 - Value for drinking water toxicity has been adopted from the US EPA Region 9 resident tap water f

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table B(1) - Groundwater Analytical Results
Project Number: 52372
Project Name: Penrith Central Car Park

				VOC	MNA Parameters											EPA VIC - IWRG621	
				Total MAH*	Ferrous Iron - Fe2+	Nitrate (as N)	Sulphate (as SO4)	Chloride	Bicarbonate Alkalinity (as CaCO3)	Carbonate Alkalinity (as CaCO3)	Hydroxide Alkalinity (as CaCO3)	Total Alkalinity (as CaCO3)	pH_Lab	Total Organic Carbon	Chlorinated Hydrocarbons EPAVic	Other Chlorinated Hydrocarbons EF
				MG/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ph Units	mg/L	µg/L	µg/L
EQL				0.003	0.05	0.005	1	1	5	5	5	5	0.1	1	5	5
ANZECC 2000 Fresh Water 95 %																
ADWG 2011 (November 2017) - Aesthetic																
ADWG 2011 (November 2017) - Health																
ADWG 2011 (as Amended November 2017) (Factor 10) Aesthetics																
ADWG 2011 (as Amended November 2017) (Factor 10) Health																
NEPM Groundwater HSL (A&B) for Vapour Intrusion 4 m to 8 m (Clay)																
NEPM Groundwater HSL (C) for Vapour Intrusion 4 m to 8 m (Clay)																
NEPM Groundwater HSL (D) for Vapour Intrusion 4 m to 8 m (Clay)																
US EPA, RSL Region 9, Resident Tap Water x 10																
Sample ID	**Sample Date**	**Depth to SWL**	**Lab Report Number**													
JBS&G (2017)																
PSM01	26/05/2017	6.96	548083	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01_W	26/05/2017	6.96	548083	-	-	-	-	-	-	-	-	-	-	-	-	-
QC01-W/A	26/05/2017	6.96	168063	-	-	-	-	-	-	-	-	-	-	-	-	-
PSM02	26/05/2017	6.95	548083	-	-	-	-	-	-	-	-	-	-	-	-	-
PSM03	26/05/2017	8.01	548083	-	-	-	-	-	-	-	-	-	-	-	-	-
JBS&G (2018)																
JBMW01			545643	-	-	-	-	-	-	-	-	-	-	-	-	-
QA20180416	16/04/2018	7.5	189745	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20180416			545643	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW02	16/04/2018	7.065	545643	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW02	15/11/2018	7.181	627998	<0.003	1.9	1.2	140	2600	-	-	-	600	8.2	20	77	77
JBMW03			545643 / 595919	-	-	-	-	-	-	-	-	-	-	-	-	-
QA20180416-1	16/04/2018	7.33	189745	-	-	-	-	-	-	-	-	-	-	-	-	-
QC20180416-1			545643	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW04	16/04/2018	7.14	545643	-	-	-	-	-	-	-	-	-	-	-	-	-
JBMW05	15/11/2018	7.167	627998	<0.003	0.11	<0.02	280	2900	-	-	-	620	7.8	28	122	122
JBMW06	21/11/2018	7.261	628902	<0.003	-	-	-	-	-	-	-	-	-	-	<5	<5
JBMW07	21/11/2018	7.275	628902	<0.003	-	-	-	-	-	-	-	-	-	-	<5	<5
PSM01	16/04/2018	7.19	545643	-	-	-	-	-	-	-	-	-	-	-	-	-
PSM01	15/11/2018	7.259	627998	<0.003	<0.05	1	59	2000	-	-	-	440	8	27	61	61
QA151118	15/11/2018	7.259	627998	<0.003	<0.05	1.1	60	2000	-	-	-	430	7.7	19	64	64
QC15118	15/11/2018	7.259	205736	-	1.7	0.82	63	1800	400	<5	<5	400	6.5	2	-	-
PSM02	16/04/2018	7.8	545643	-	-	-	-	-	-	-	-	-	-	-	-	-
PSM03	16/04/2018	8.31	545643	-	-	-	-	-	-	-	-	-	-	-	-	-

Data Comments

#1 NIL (+)VE
2 - Value for drinking water toxicity has been adopted from the US EPA Region 9 resident tap water f

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table C - Soil Vapour
Project Number: 52372
Project Name: Penrith Central Car Park

					Organic Alcohols	Chlorinated Alkanes														Chlorinated Alkenes										Trihalomethanes				TRHs (NEPM 2013)				BTEX						
					Isopropyl alcohol	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromochloromethane	Carbon tetrachloride	Trichlorofluoromethane	1,1-dichloroethene	1,1-dichloropropene	2-chlorotoluene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	>C10-C16 Fraction	C6-C10 Fraction	F1 (C6-C10 - BTEX)	F2 (C6-C10 - Naphthalene)	Benzene	Ethylbenzene	Toluene	Xylene (Total)	Xylene (m)	Xylene (o)	Xylene (p)
					mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3			
EQL					1.67	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	1.67	1.67	1.67	1.67	0.08	0.08	0.08	0.25			
NEPM 2013 Interim HILs for VOCCs - Residential B							60																	0.08		2		0.02	0.03															
NEPM 2013 Interim HILs for VOCCs - Commercial/Industrial D							230																	0.3		8		0.08	0.1															
NEPM 2013 Interim HILs for VOCCs - Recreational C							1200																	2		40		0.4	0.5															
NEPM 2013 Soil Vapour HSL A & HSL B - Sand 0 to <1m																																			180	130	1	330	1300	220			
NEPM 2013 Soil Vapour HSL C - Sand 0 to <1m																																			86,000	NL	360	NL	NL	NL			
NEPM 2013 Soil Vapour HSL D - Sand 0 to <1m																																			680	500	4	1300	4800	840			
Sample ID	**Location**	**Sample Depth (m bgs)**	**Lab Report**	**Sample Date**																																								
JBS&G (2017)																																											
QC01_SV	SV01_FRONT	0.2-0.3	545643	05-05-17	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<1.667	<1.667	<1.667	<1.667	<0.083	<0.083	<0.083	<0.25	-	-	-
SV01_FRONT	SV01	0.2-0.3	545643	05-05-17	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<1.667	<1.667	<1.667	<1.667	<0.083	<0.083	<0.083	<0.25	-	-	-
SV02_FRONT	SV02	0.2-0.3	545643	05-05-17	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<1.667	<1.667	<1.667	<1.667	<0.083	<0.083	<0.083	<0.25	-	-	-
SV03_FRONT	SV03	0.2-0.3	545643	05-05-17	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	<0.083	<0.083	<0.083	<0.25	-	-	-
SV04_FRONT	SV04	0.2-0.3	545643	05-05-17	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<1.667	<1.667	<1.667	1.833	<0.083	<0.083	<0.083	<0.25	-	-	-
SV05_FRONT	SV05	0.2-0.3	545643	05-05-17	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	56.67	<0.083	9.333	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	<0.083	<0.083	<0.083	<0.25	-	-	-
SV06_FRONT	SV06	0.2-0.3	545643	05-05-17	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	<0.083	<0.083	<0.083	<0.25	-	-	-
SV07_FRONT	SV07	0.2-0.3	545643	05-05-17	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	<0.083	<0.083	<0.083	<0.25	-	-	-
SV08_FRONT	SV08	0.2-0.3	545643	05-05-17	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	<0.083	<0.083	<0.083	<0.25	-	-	-
SV09_FRONT	SV09	0.2-0.3	545643	05-05-17	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	<0.083	<0.083	<0.083	<0.25	-	-	-
SV10_FRONT	SV10	0.2-0.3	545643	05-05-17	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	14.5	<0.083	3.5	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	<0.083	<0.083	<0.083	<0.25	-	-	-
Data Gap Investigation																																												
SV11 - FRONT	SV11	0.2-0.3	594882	17-04-18	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.17	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	<0.02	<0.02	<0.02	<0.06	-	-	-
SV12 - FRONT	SV12	0.2-0.3	594882	17-04-18	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	<0.02	<0.02	<0.02	<0.06	-	-	-
SV13 - FRONT	SV13	0.2-0.3	594882	17-04-18	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	<0.02	<0.02	<0.02	<0.06	-	-	-
SV14 - FRONT	SV14	0.2-0.3	594882	17-04-18	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	42	<0.02	2.88	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	<0.02	<0.02	<0.02	<0.06	-	-	-
SV15 - FRONT	SV15	0.2-0.3	594882	17-04-18	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	<0.02	<0.02	<0.02	<0.06	-	-	-
QC20180417 - FRONT	SV15 - FRONT	0.2-0.3	594882	17-04-18	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	<0.02	<0.02	<0.02	<0.06	-	-	-
SV16 - FRONT	SV16	0.2-0.3	594882	17-04-18	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	1.58	<0.02	0.168	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	<0.02	<0.02	<0.02	<0.06	-	-	-
SV17 - FRONT	SV17	0.2-0.3	594882	17-04-18	<0.4	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	<0.02	<0.02	<0.02	<0.06	-	-	-
SV18 (FRONT)	SV18	4.7-5.0	627998	15-11-18	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	158.33	<0.083	1.38	<0.083	<0.083	0.27	<0.083	<0.083	<0.083	-	-	-	-	<0.083	<0.083	0.1	0.3	-	-	-
QA-V (FRONT)	SV18 - FRONT	4.7-5.0	627998	15-11-18	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	366.667	<0.083	1.62	<0.083	<0.083	0.28	<0.083	<0.083	<0.083	-	-	-	-	<0.083	<0.083	0.167	0.417	-	-	-
SV19 (FRONT)	SV19	4.7-5.0	627998	15-11-18	<1.667	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	0.333	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	950	<0.083	8.83	<0.083	<0.083	0.33	<0.083	<0.083	-	-	-	-	<0.083	<0.083	<0.083	<0.25	-	-	-
QC-V	SV19 - FRONT	4.7-5.0	205736	15-11-18	-	-	-	-	-	-	-	-	<0.083	-	-	-	-	<0.083	-	-	-	-	-	-	-	1300	-	8.83	-	-	-	-	-	-	-	-	-	-	<0.083	<0.083	<0.083	-	<0.083	<0.083	<0.083

Table C - Soil Vapour
Project Number: 52372
Project Name: Penrith Central Car Park

					Polycyclic Aromatic Hydrocarbons	Monocyclic Aromatic Hydrocarbons									Miscellaneous Hydrocarbons					Chlorinated Benzenes						Miscellaneous Industrial Chemicals		Organochlorine Pesticides	Solvents				
					Naphthalene	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	4-isopropyl toluene	Isopropylbenzene	n-butyl benzene	n-propyl benzene	sec-butyl benzene	Styrene	Tert-butyl benzene	1,2-dibromoethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Cyclohexane	Dibromomethane	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Hexachlorobutadiene	Acrylonitrile	Epichlorohydrin	1,4-Dioxane	2-Propanone (Acetone)	Benzyl chloride	Ethyl Acetate	Hexane
					mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3
EQL					0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.83	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08						
NEPM 2013 Interim HILs for VOCCs - Residential B																																
NEPM 2013 Interim HILs for VOCCs - Commercial/Industrial D																																
NEPM 2013 Interim HILs for VOCCs - Recreational C																																
NEPM 2013 Soil Vapour HSL A & HSL B - Sand 0 to <1m					0.8																											
NEPM 2013 Soil Vapour HSL C - Sand 0 to <1m					410																											
NEPM 2013 Soil Vapour HSL D - Sand 0 to <1m					3																											
Sample ID	**Location**	**Sample Depth (m bgs)**	**Lab Report**	**Sample Date**																												
JBS&G (2017)																																
QC01_SV	SV01_FRONT	0.2-0.3	545643	05-05-17	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	-	-	-
SV01_FRONT	SV01	0.2-0.3	545643	05-05-17	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	-	-	-
SV02_FRONT	SV02	0.2-0.3	545643	05-05-17	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	-	-	-
SV03_FRONT	SV03	0.2-0.3	545643	05-05-17	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	-	-	-
SV04_FRONT	SV04	0.2-0.3	545643	05-05-17	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	-	-	-
SV05_FRONT	SV05	0.2-0.3	545643	05-05-17	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	-	-	-
SV06_FRONT	SV06	0.2-0.3	545643	05-05-17	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	-	-	-
SV07_FRONT	SV07	0.2-0.3	545643	05-05-17	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	-	-	-
SV08_FRONT	SV08	0.2-0.3	545643	05-05-17	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	-	-	-
SV09_FRONT	SV09	0.2-0.3	545643	05-05-17	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	-	-	-
SV10_FRONT	SV10	0.2-0.3	545643	05-05-17	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	-	-	-
Data Gap Investigation																																
SV11 - FRONT	SV11	0.2-0.3	594882	17-04-18	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-	-
SV12 - FRONT	SV12	0.2-0.3	594882	17-04-18	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-	-
SV13 - FRONT	SV13	0.2-0.3	594882	17-04-18	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-	-
SV14 - FRONT	SV14	0.2-0.3	594882	17-04-18	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-	-
SV15 - FRONT	SV15	0.2-0.3	594882	17-04-18	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-	-
QC20180417 - FRONT	SV15 - FRONT	0.2-0.3	594882	17-04-18	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-	-
SV16 - FRONT	SV16	0.2-0.3	594882	17-04-18	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-	-
SV17 - FRONT	SV17	0.2-0.3	594882	17-04-18	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.2	<0.02	<0.02	-	-	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	-	-	-	-	-	-	-
SV18 (FRONT)	SV18	4.7-5.0	627998	15-11-18	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.833	<0.083	<0.083	-	-	-	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	-	-	-
QA-V (FRONT)	SV18 - FRONT	4.7-5.0	627998	15-11-18	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.833	<0.083	<0.083	-	-	-	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	-	-	-
SV19 (FRONT)	SV19	4.7-5.0	627998	15-11-18	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.833	<0.083	<0.083	-	-	-	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	<0.083	-	-	-	-	-	-	-
QC-V	SV19 - FRONT	4.7-5.0	205736	15-11-18	<0.083	-	-	-	<0.8333	-	-	-	<0.8333	-	-	<0.083	<0.083	<0.083	-	-	-	-	-	-	<0.8333	-	<0.8333	<0.8333	<0.8333	<0.8333	<0.8333	<0.8333	<0.8333

Table D - Indoor Air
Project Number: 52372
Project Name: Penrith Central Park

				Organic Alcohols		Chlorinated Alkanes												Chlorinated Alkenes								Trihalomethanes				BTEX					Polycyclic Aromatic Hydrocarbons	Monocyclic Aromatic Hydrocarbons			Miscellaneous Hydrocarbons								Chlorinated Benzenes				
				Ethanol	Isopropyl alcohol	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2-dichloroethane	1,2-dichloropropane	1,2-dichlorotetrafluoroethane	Carbon tetrachloride	Chloroethane	Chloromethane	Dichlorodifluoromethane	Dichloromethane	Trichlorofluoromethane	1,1,2-trichlorotrifluoroethane	1,1-dichloroethene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Naphthalene	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	Styrene	1,2-dibromoethane	2-Butanone (MEK)	2-Hexanone (MBK)	4-Methyl-2-pentanone (MIBK)	Bromomethane	Cyclohexane	Vinyl Acetate	1,2,4-trichlorobenzene	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene
				µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
EQL				9.00	12.00	2.70	3.00	2.70	2.00	2.00	2.00	2.50	3.00	1.00	1.00	2.50	17.00	2.80	3.80	2.00	2.00	2.00	3.00	2.00	2.00	2.70	1.00	3.00	2.00	1.60	5.00	1.60	2.00	1.90	2.00	4.00	2.60	2.50	2.50	2.00	3.80	1.50	2.00	2.00	1.90	1.70	1.80	3.70	3.00	3.00	3.00	2.00
NEPM 2013 HIL Commercial/industrial D Indoor Air (Attenuation Factor 0.1)						23000															30			800									8	10																		
Sample ID	**Location**	**Sample Date**	**Attenuation Conditions**																																																		
140-Bath	Shop 3, 140 Henry Street - Water Closet	09-04-18	High air exchange volume (hot day)	21,000	<12	<2.7	<3	<2.7	<2	<2	<2	<2.5	<3	<1	<1	<2.5	<17	<2.8	<3.8	<2	<2	<2	<3	<2	<2	<2.7	<1	<3	10	<1.6	<5	3	<2	4	<2	<4	<2.6	<2.5	<2.5	<2	<3.8	<1.5	<2	<2	<1.9	<1.7	<1.8	<3.7	<3	<3	<3	<2
140_Bath	Shop 3, 140 Henry Street - Water Closet	17-04-18	Atmospheric pressure drop	57	28	<2.7	<3	<2.7	<2	<2	<2	<2.5	<3	<1	<1	3	<17	<2.8	<3.8	<2	<2	<2	<3	<2	<2	<2.7	<1	<3	4	<1.6	<5	3	<2	5	<2	<4	<2.6	<2.5	<2.5	<2	<3.8	<1.5	<2	<2	<1.9	<1.7	<1.8	<3.7	<3	<3	<3	<2
140-Shop	Shop 3, 140 Henry Street - Shop	09-04-18	High air exchange volume (hot day)	200	<12	<2.7	<3	<2.7	<2	<2	<2	<2.5	<3	<1	<1	3	<17	<2.8	<3.8	<2	<2	<2	5	<2	<2	20	<1	<3	<2	<1.6	<5	2	<2	6	4	10	<2.6	5	3	<2	<3.8	<1.5	<2	<2	<1.9	<1.7	<1.8	<3.7	<3	<3	<3	<2
140_Shop	Shop 3, 140 Henry Street - Shop	17-04-18	Atmospheric pressure drop	88	<12	<2.7	<3	<2.7	<2	<2	<2	<2.5	<3	<1	<1	3	<17	<2.8	<3.8	<2	<2	<2	<3	<2	<2	<2.7	<1	<3	<2	<1.6	<5	4	<2	4	<2	<4	<2.6	7	<2.5	<2	<3.8	<1.5	<2	<2	<1.9	<1.7	<1.8	<3.7	<3	<3	<3	<2
140_Shop	Shop 3, 140 Henry Street - Shop	03-05-18	High air exchange volume (hot day)	72	<12	<2.7	<3	<2.7	<2	<2	<2	<2.5	<3	<1	<1	3	<17	<2.8	<3.8	<2	<2	<2	4	<2	<2	5	<1	<3	<2	<1.6	<5	4	2	10	3	8	<2.6	<2.5	<2.5	2	<3.8	<1.5	<2	<2	<1.9	3	<1.8	<3.7	<3	<3	<3	<2
140_SHOP	Shop 3, 140 Henry Street - Shop	15-Nov-18	High air exchange volume (hot day)	97	20	<2.7	<3.4	<2.7	<2	<2	<2.3	<2.5	<3.1	<1.3	<1	<2.5	<17	<2.8	<3.8	<2	<2	<2.3	<3.4	<2	<2.3	<2.7	<1.3	<3.4	<2.4	<1.6	<5.2	<1.6	<2.2	2	<2.2	<4.3	<2.6	<2.5	<2.5	<2.1	<3.8	<1.5	<2	<2	<1.9	<1.7	<1.8	<3.7	<3	<3	<3	<2.3
QA_AA1	Shop 3, 140 Henry Street - Shop	15-Nov-18	High air exchange volume (hot day)	100	20	<2.7	<3.4	<2.7	<2	<2	<2.3	<2.5	<3.1	<1.3	<1	<2.5	<17	<2.8	<3.8	<2	<2	<2.3	<3.4	<2	<2.3	<2.7	<1.3	<3.4	<2.4	<1.6	<5.2	<1.6	<2.2	2	<2.2	<4.3	<2.6	<2.5	<2.5	<2.1	<3.8	<1.5	<2	<2	<1.9	<1.7	<1.8	<3.7	<3	<3	<3	<2.3
140_SHOP_2	Shop 3, 140 Henry Street - Massage Room	15-Nov-18	High air exchange volume (hot day)	140	<12	<2.7	<3.4	<2.7	<2	<2	<2.3	<2.5	<3.1	<1.3	<1	3	<17	<2.8	<3.8	<2	<2	<2.3	5	<2	<2.3	<2.7	<1.3	<3.4	<2.4	<1.6	<5.2	<1.6	<2.2	2	<2.2	<4.3	<2.6	4	<2.5	<2.1	<3.8	<1.5	<2	<2	<1.9	<1.7	<1.8	<3.7	<3	<3	<3	<2.3
2/134_SHOP	Shop 1, 138 - 134 Henry Street - Café	15-Nov-18	High air exchange volume (hot day)	350	<12	<2.7	<3.4	<2.7	<2	<2	<2.3	<2.5	<3.1	<1.3	<1	<2.5	<17	<2.8	<3.8	<2	<2	<2.3	<3.4	<2	<2.3	<2.7	<1.3	<3.4	3	<1.6	<5.2	<1.6	3	4	10	30	<2.6	20	10	<2.1	<3.8	<1.5	<2	<2	<1.9	<1.7	<1.8	<3.7	<3	<3	<3	<2.3
DC_Bath	The Dry Cleaner, 134-138 Henry Street - Water Closet	17-04-18	Atmospheric pressure drop	650	<12	<2.7	<3	<2.7	<2	<2	<2	<2.5	<3	<1	<1	3	<17	<2.8	<3.8	<2	<2	<2	8	<2	<2	<2.7	<1	<3	2	2	<5	2	7	4	<2	20	<2.6	4	<2.5	<2	<3.8	<1.5	<2	<2	<1.9	<1.7	<1.8	<3.7	<3	<3	<3	<2
PC-Bath	The Dry Cleaner, 134-138 Henry Street - Water Closet	09-04-18	High air exchange volume (hot day)	25	44	<2.7	<3	<2.7	<2	<2	<2	<2.5	<3	<1	<1	3	<17	<2.8	<3.8	<2	<2	<2	7	<2	<2	<2.7	<1	<3	<2	<1.6	<5	<1.6	<2	4	<2	<4	<2.6	<2.5	<2.5	<2	<3.8	<1.5	<2	<2	<1.9	<1.7	<1.8	<3.7	<3	<3	<3	<2
DC_Shop	The Dry Cleaner, 134-138 Henry Street - Shop	17-04-18	Atmospheric pressure drop	120	<12	<2.7	<3	<2.7	<2	<2	<2	<2.5	<3	<1	<1	3	<17	<2.8	<3.8	<2	<2	<2	8	<2	<2	<2.7	<1	<3	<2	2	<5	2	<2	4	<2	<4	<2.6	<2.5	<2.5	<2	<3.8	<1.5	<2	<2	<1.9	<1.7	<1.8	<3.7	<3	<3	<3	<2
PC-Shop	The Dry Cleaner, 134-138 Henry Street - Shop	09-04-18	High air exchange volume (hot day)	20	<24	<2.7	<3	<2.7	<2	<2	<2	<2.5	<3	<1	<1	3	<17	<2.8	<3.8	<2	<2	<2	7	<2	<2	<2.7	<1	<3	<2	<1.6	<5	<1.6	<2	5	<2	<4	<2.6	<2.5	<2.5	<2	<3.8	<1.5	<2	<2	<1.9	<1.7	<1.8	<3.7	<3	<3	<3	<2
Ambient Outside	Adjacent Northern Wall of The Dry Cleaner	17-04-18	Atmospheric pressure drop	12	<12	<2.7	<3	<2.7	<2	<2	<2	<2.5	<3	<1	<1	3	<17	<2.8	<3.8	<2	<2	<2	<3	<2	<2	<2.7	<1	<3	<2	<1.6	<5	2	<2	3	<2	<4	<2.6	<2.5	<2.5	<2	<3.8	<1.5	<2	<2	<1.9	<1.7	<1.8	<3.7	<3	<3	<3	<2
Statistical Summary																																																				
Number of Results				13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Number of Detects				13	4	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	7	0	0	2	0	0	3	2	0	7	3	13	3	4	0	5	2	1	0	0	0	0	0	1	0	0	0	0	0	0	0
Minimum Concentration				12	<12	<2.7	<3	<2.7	<2	<2	<2	<2.5	<3	<1	<1	<2.5	<17	<2.8	<3.8	<2	<2	<2	<3	<2	<2	<2.7	<1	<3	<2	<1.6	<5	<1.6	<2	2	<2	<4	<2.6	<2.5	<2.5	<2	<3.8	<1.5	<2	<2	<1.9	<1.7	<1.8	<3.7	<3	<3	<3	<2
Minimum Detect				12	20	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	ND	ND	ND	ND	ND	ND	4	ND	ND	5	ND	ND	2	2	ND	2	2	2	3	8	ND	4	3	2	ND	ND	ND	ND	ND	3	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration				650	44	<2.7	<3.4	<2.7	<2	<2	<2.3	<2.5	<3.1	<1.3	<1	3	<17	<2.8	<3.8	<2	<2	<2.3	8	<2	<2.3	20	<1.3	<3.4	4	2	<5.2	4	7	10	10	30	<2.6	20	10	<2.1	<3.8	<1.5	<2	<2	<1.9	3	<1.8	<3.7	<3	<3	<3	<2.3
Maximum Detect				650	44	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	3	ND	ND	ND	ND	ND	ND	8	ND	ND	20	ND	ND	4	2	ND	4	7	10	10	30	ND	20	10	2	ND	ND	ND	ND	ND	3	ND	ND	ND	ND	ND	ND	ND
Average Concentration				149	13	1.4	1.6	1.4	1	1	1	1.3	1.5	0.55	0.5	2.6	8.5	1.4	1.9	1	1	1	4.1	1	1	3.1	0.55	1.6	1.5	0.98	2.5	1.8	1.7	4.2	2.1	6.7	1.3	3.8	2.1	1.1	1.9	0.75	1	1	0.95	1	0.9	1.9	1.5	1.5	1.5	1
Median Concentration				97	6	1.35	1.5	1.35	1	1	1	1.25	1.5	0.5	0.5	3	8.5	1.4	1.9	1	1	1	4	1	1	1.35	0.5	1.5	1	0.8	2.5	2	1	4	1	2.15	1.3	1.25	1.25	1	1.9	0.75	1	1	0.95	0.85	0.9	1.85	1.5	1.5	1.5	1
Standard Deviation				175	12	0	0.096	0	0	0	0.072	0	0.024	0.072	0	0.77	0	0	0	0	0	0.072	2.7	0	0.072	5.2	0.072	0.096	0.95	0.45	0.048	1.2	1.7	2.1	2.6	8.8	0	5.2	2.4	0.27	0	0	0	0	0	0.6	0	0	0	0	0	0.072
Number of Guideline Exceedances				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table D - Indoor Air
Project Number: 52372
Project Name: Penrith Central Park

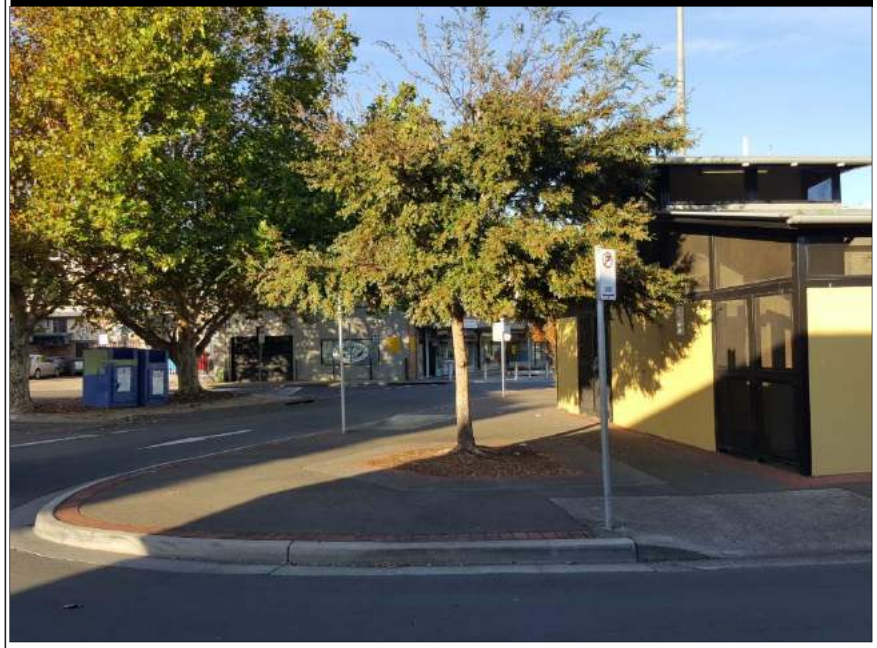
				Solvents												Organic Sulfur Compounds	Miscellaneous Industrial Chemicals	Herbicides & Fungicides
				1,3-Butadiene	1,4-Dioxane	2-Propanone (Acetone)	4-ethyl toluene	Benzyl chloride	Ethyl Acetate	Heptane	Hexane	Methyl Methacrylate	MTBE	Propylene	Tetrahydrofuran	Carbon disulfide	Hexachlorobutadiene	Acrolein
				µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3	µg/m3
EQL				1.00	1.80	12.00	2.50	2.60	1.80	2.00	1.80	2.00	1.80	0.90	1.50	1.60	5.00	1.00
NEPM 2013 HIL Commercial/industrial D Indoor Air (Attenuation Factor 0.1)																		
Sample ID	**Location**	**Sample Date**	**Attenuation Conditions**															
140-Bath	Shop 3, 140 Henry Street - Water Closet	09-04-18	High air exchange volume (hot day)	<1	<1.8	20	<2.5	<2.6	2	<2	34	<2	<1.8	<0.9	<1.5	<1.6	<5	<1
140_Bath	Shop 3, 140 Henry Street - Water Closet	17-04-18	Atmospheric pressure drop	<1	<1.8	20	<2.5	<2.6	<1.8	<2	4	<2	<1.8	3	<1.5	<1.6	<5	<1
140-Shop	Shop 3, 140 Henry Street - Shop	09-04-18	High air exchange volume (hot day)	<1	<1.8	20	<2.5	<2.6	4	<2	63	<2	<1.8	<0.9	<1.5	<1.6	<5	1
140_Shop	Shop 3, 140 Henry Street - Shop	17-04-18	Atmospheric pressure drop	<1	<1.8	20	<2.5	<2.6	<1.8	<2	2	<2	<1.8	3	<1.5	<1.6	<5	<1
140_Shop	Shop 3, 140 Henry Street - Shop	03-05-18	High air exchange volume (hot day)	<1	<1.8	10	<2.5	<2.6	<1.8	<2	3	<2	<1.8	<0.9	<1.5	<1.6	<5	<1
140_SHOP	Shop 3, 140 Henry Street - Shop	15-Nov-18	High air exchange volume (hot day)	<1.1	<1.8	<12	<2.5	<2.6	5	<2	<1.8	<2	<1.8	<0.9	<1.5	2	<5.3	<1.1
QA_AA1	Shop 3, 140 Henry Street - Shop	15-Nov-18	High air exchange volume (hot day)	<1.1	<1.8	<12	<2.5	<2.6	5	<2	<1.8	<2	<1.8	<0.9	<1.5	2	<5.3	<1.1
140_SHOP_2	Shop 3, 140 Henry Street - Massage Room	15-Nov-18	High air exchange volume (hot day)	<1.1	<1.8	<12	<2.5	<2.6	<1.8	<2	<1.8	<2	<1.8	<0.9	<1.5	<1.6	<5.3	<1.1
2/134_SHOP	Shop 1, 138 - 134 Henry Street - Café	15-Nov-18	High air exchange volume (hot day)	<1.1	<1.8	30	4	<2.6	25	2	<1.8	<2	<1.8	<0.9	<1.5	<1.6	<5.3	8
DC_Bath	The Dry Cleaner, 134-138 Henry Street - Water Closet	17-04-18	Atmospheric pressure drop	<1	<1.8	20	<2.5	<2.6	<1.8	<2	4	<2	<1.8	<0.9	<1.5	<1.6	<5	<1
PC-Bath	The Dry Cleaner, 134-138 Henry Street - Water Closet	09-04-18	High air exchange volume (hot day)	<1	<1.8	20	<2.5	<2.6	2	<2	46	<2	<1.8	5	<1.5	<1.6	<5	<1
DC_Shop	The Dry Cleaner, 134-138 Henry Street - Shop	17-04-18	Atmospheric pressure drop	<1	<1.8	20	<2.5	<2.6	<1.8	<2	3	<2	<1.8	<0.9	<1.5	<1.6	<5	<1
PC-Shop	The Dry Cleaner, 134-138 Henry Street - Shop	09-04-18	High air exchange volume (hot day)	<1	<1.8	10	<2.5	<2.6	<1.8	<2	60	<2	<1.8	<0.9	<1.5	<1.6	<5	<1
Ambient Outside	Adjacent Northern Wall of The Dry Cleaner	17-04-18	Atmospheric pressure drop	<1	<1.8	30	<2.5	<2.6	<1.8	<2	2	<2	<1.8	3	<1.5	<1.6	<5	<1
Statistical Summary																		
Number of Results				13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Number of Detects				0	0	10	1	0	5	1	9	0	0	4	0	2	0	2
Minimum Concentration				<1	<1.8	10	<2.5	<2.6	<1.8	<2	<1.8	<2	<1.8	<0.9	<1.5	<1.6	<5	<1
Minimum Detect				ND	ND	10	4	ND	2	2	2	ND	ND	3	ND	2	ND	1
Maximum Concentration				<1.1	<1.8	30	4	<2.6	25	2	63	<2	<1.8	5	<1.5	2	<5.3	8
Maximum Detect				ND	ND	30	4	ND	25	2	63	ND	ND	5	ND	2	ND	8
Average Concentration				0.52	0.9	17	1.5	1.3	3.7	1.1	15	1	0.9	1.4	0.75	0.98	2.5	1.1
Median Concentration				0.5	0.9	20	1.25	1.3	0.9	1	3	1	0.9	0.45	0.75	0.8	2.5	0.5
Standard Deviation				0.024	0	8.4	0.76	0	6.6	0.28	24	0	0	1.5	0	0.45	0.072	2.1
Number of Guideline Exceedances				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)				0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix A Photographic Log

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1 – EASTERN CORNER LOOKING SOUTH



2 – EASTERN CORNER LOOKING WEST

3 – EASTERN CORNER LOOKING SOUTH (2)

4 – EASTERN CORNER LOOKING SOUTHWEST

JBS&G

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5 – EASTERN PORTION LOOKING NORTHWEST

6 – EASTERN PORTION LOOKING WEST

7 – EASTERN PORTION LOOKING WEST-SOUTHWEST

8 – EASTERN PORTION LOOKING WEST-SOUTHWEST

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD

Not to Scale

Coord. Sys n/a

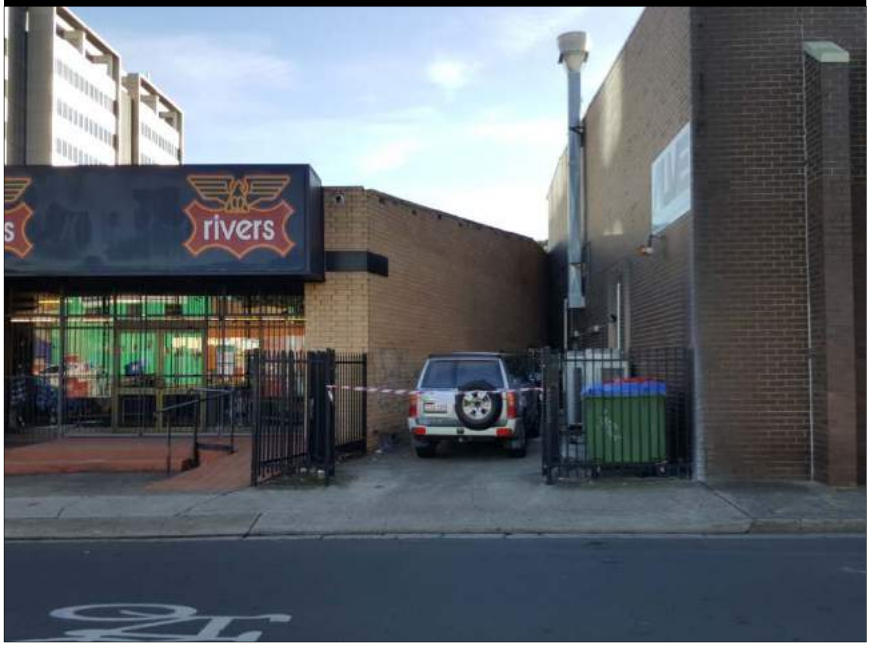
114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

9 – CENTRAL PORTION LOOKING TO FORMER SERVICE STATION (RIVERS)

10 – CENTRAL PORTION LOOKING TO FORMER SERVICE STATION (RIVERS)



11 – CENTRAL PORTION LOOKING NORTH

12 – CENTRAL PORTION LOOKING TO CURRENT DRYCLEANERS

JBS&G

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

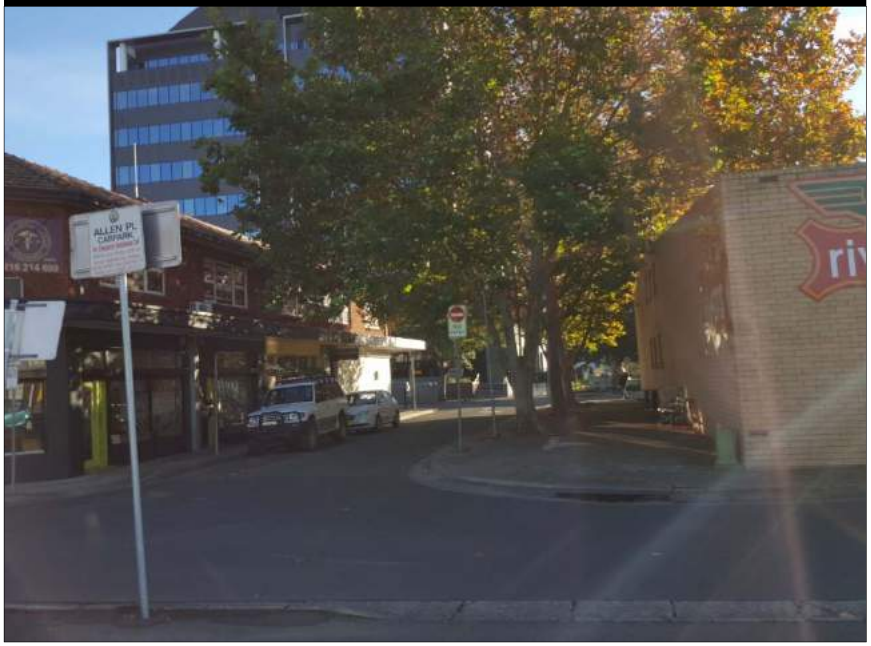
114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

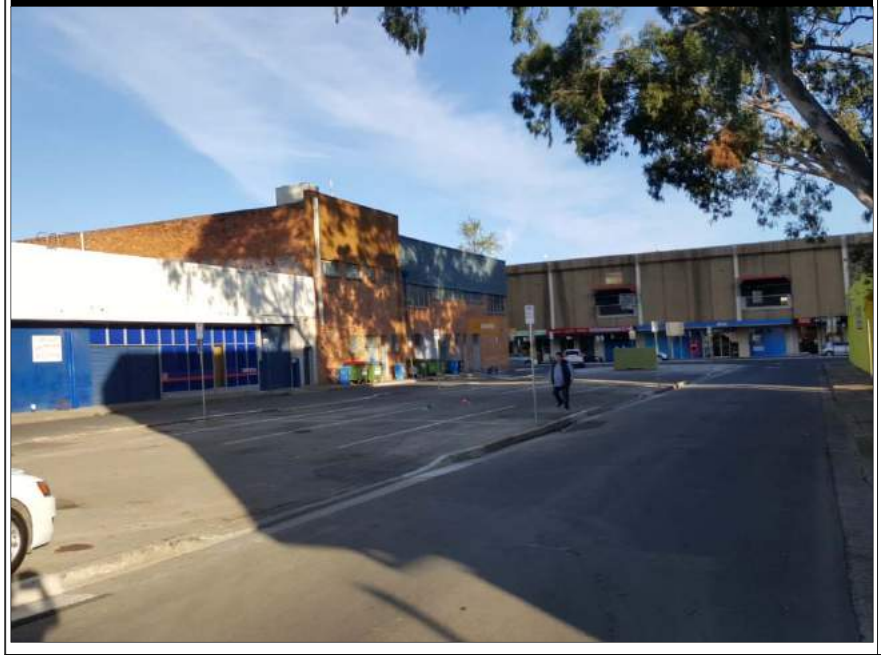
Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

13 – CENTRAL PORTION LOOKING NORTH (DRY CLEANER & GAYMARK LANE)

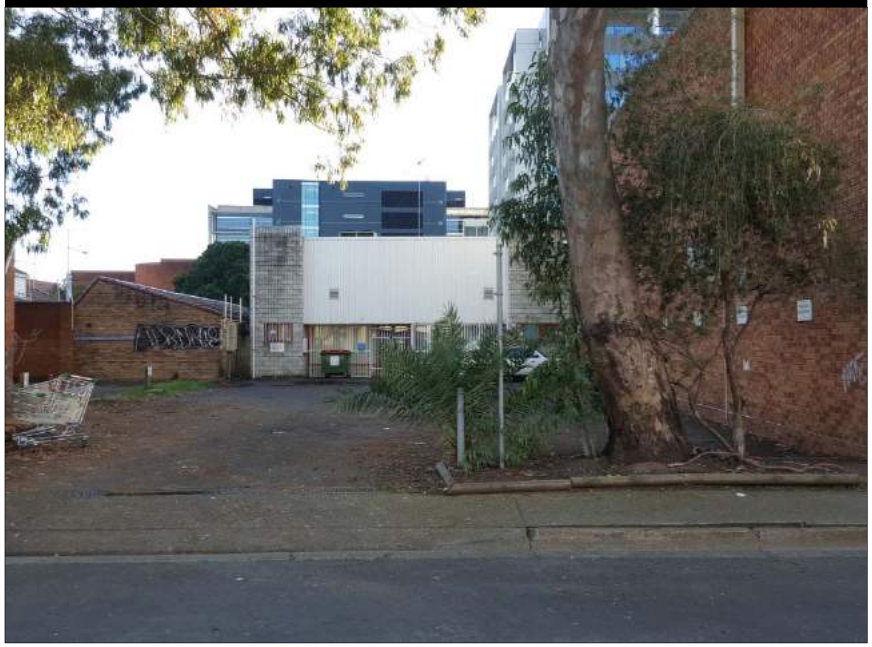
14 - CENTRAL PORTION LOOKING NORTH (DRY CLEANER & GAYMARK LANE)



15 – WESTERN PORTION LOOKING WEST



16 – WESTERN PORTION LOOKING NORTH



JBS&G

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

17 – WESTERN PORTION LOOKING WEST

18 – NORTH WESTERN CORNER LOOKING EAST (44 STATION ST)

19 – NORTHWEST CORNER (44 STATION ST)

20 – NORTHWEST CORNER (44 STATION ST)

JBS&G

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

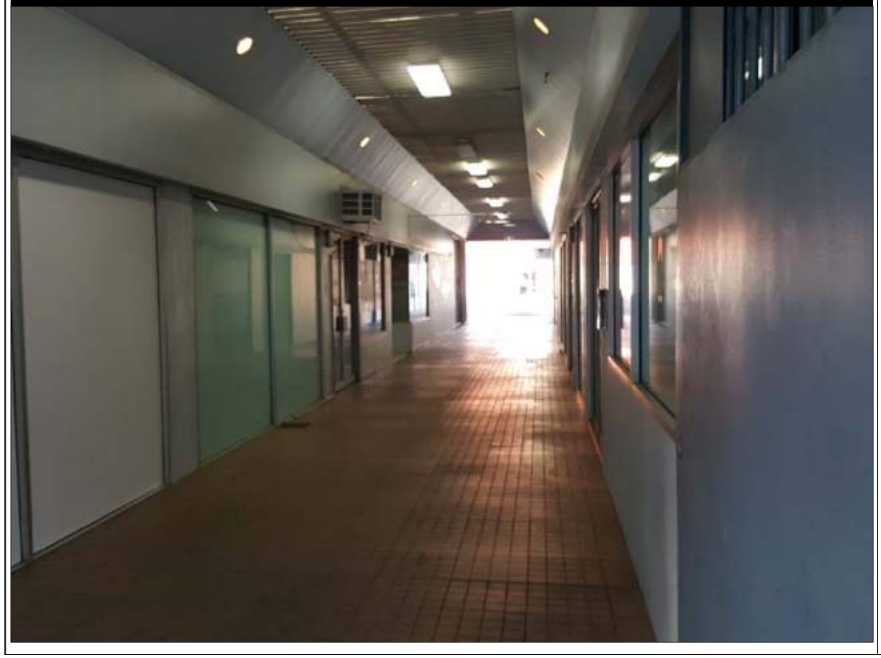
APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

21 – NORTHWEST CORNER (44 STATION ST)

22 – NORTHERN BOUNDARY LOOKING EAST

23 – NORTHERN BOUNDARY LOOKING SOUTH



24 – NORTHERN BOUNDARY LOOKING EAST

JBS&G

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

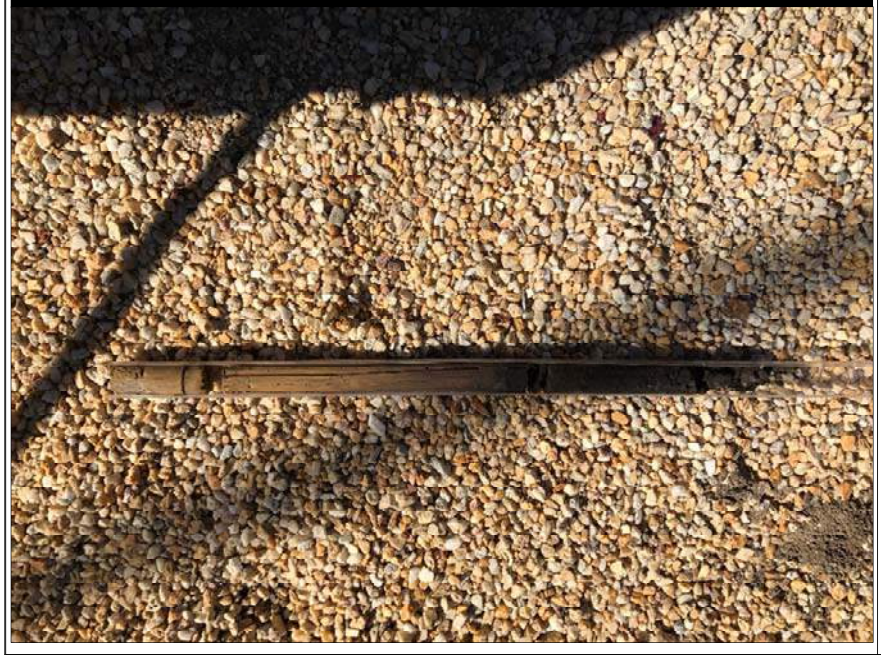
APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

25 – NORTHERN BOUNDARY CNR OF GAYMARK LANE LOOKING EAST

26 – NORTHERN BOUNDARY CNR OF GAYMARK LANE LOOKING SOUTH

27 – JB01



28 – JB02

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD

Not to Scale

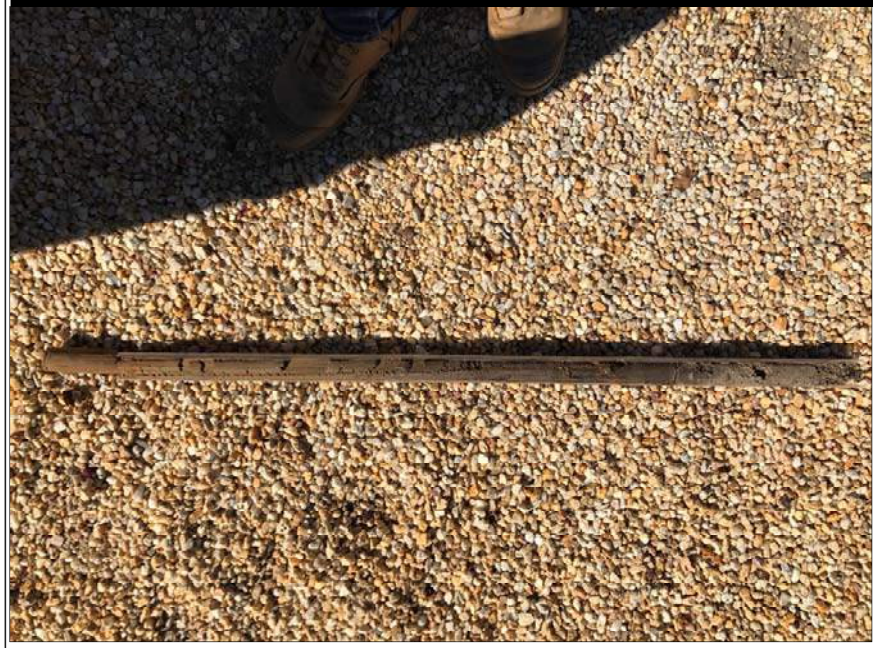
Coord. Sys n/a

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

29 – JB03



30 – JB04

31 – JB05

32 – JB08 (1)

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD

Not to Scale

Coord. Sys n/a

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

33 – JB08 (2)

34 – JB10

35 – JB10 REINSTATEMENT

36 – JB13

JBS&G

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

37 – JB14

38 – JB16 (1)

39 – JB16 (2)

40 – JB17

JBS&G

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

41 – JB18

42 – JB19

43 – JB19 REINSTATEMENT

44 – JB20

JBS&G

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

45 – JHA01 (1)

46 – JHA01 (2)

47 – JHA01 (3)

48 – JHA02

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD

Not to Scale

Coord. Sys n/a

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

49 – JHA02 (2) [INCORRECTLY LABELLED ON SITE]

50 – JHA03

51 – JHA04

52 – JHA05

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD

Not to Scale

Coord. Sys n/a

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

53 – JHA06

54 – JHA07

55 – JHA08

Job No: 52372	
Client: Penrith City Council	
Version: R01 Rev 0	Date: 6-May-2017
Drawn By: RH	Checked By: GD
Not to Scale	
Coord. Sys n/a	

114-146 Henry Street & Allen Place Car Park, Penrith, NSW

APPENDIX B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

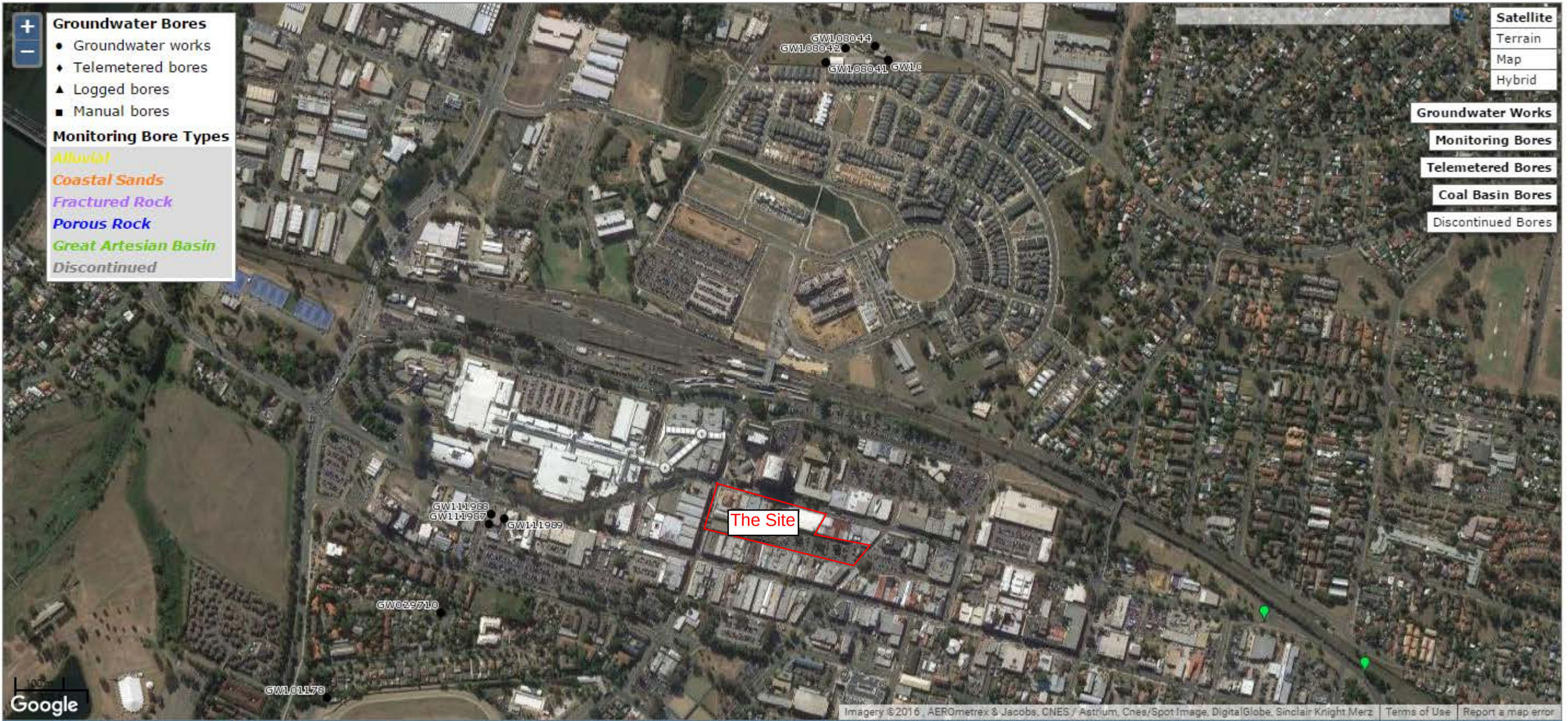
Appendix B Registered Groundwater Bore Installation Logs

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

All Groundwater Map

All data times are Eastern Standard Time

Map | Info



Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

NSW Office of Water
Work Summary

GW026231

Licence: 10BL019074 **Licence Status:** CANCELLED

Authorised Purpose(s): PUBLIC/MUNICIPL,RECREATION (GROUNDWATER)
Intended Purpose(s): IRRIGATION

Work Type: Well
Work Status:
Construct.Method:
Owner Type: Local Govt

Commenced Date:
Completion Date: 01/01/1966
Final Depth: 8.50 m
Drilled Depth: 8.50 m

Contractor Name:
Driller:
Assistant Driller:

Property: N/A
GWMA: 603 - SYDNEY BASIN
GW Zone: -
Standing Water Level (m):
Salinity Description: 1001-3000 ppm
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	90 752044
Licensed:	CUMBERLAND	MULGOA	Whole Lot //

Region: 10 - Sydney South Coast
River Basin: 212 - HAWKESBURY RIVER
Area/District:
CMA Map: 9030-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6262162.0
Easting: 285724.0
Latitude: 33°45'32.3"S
Longitude: 150°41'11.2"E

GS Map: -
MGA Zone: 0
Coordinate Source: GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	Concrete Cylnder	0.00	7.30	1828			
1	1	Casing	Concrete Cylnder	7.30	8.50	1524			Seated on Bottom

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
6.00	8.40	2.40	Unconsolidated	6.00		2.53			

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	4.26	4.26	Silt	Silt	
4.26	8.53	4.27	Gravel Alluvial Water Supply	Gravel	
0.00	4.26	4.26	Loam Clay	Loam	

Remarks

19/02/1975: SITED PENRITH PARK

***** End of GW026231 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

NSW Office of Water
Work Summary

GW029710

Licence: 10BL018657
Licence Status: CONVERTED

Authorised Purpose(s): DOMESTIC
Intended Purpose(s): GENERAL USE

Work Type: Well
Work Status:
Construct.Method: Hand Dug
Owner Type: Private

Commenced Date:
Completion Date: 01/04/1969
Final Depth: 7.90 m
Drilled Depth: 7.90 m

Contractor Name:
Driller:
Assistant Driller:

Property: N/A
GWMA: 603 - SYDNEY BASIN
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.034	90
Licensed:	CUMBERLAND	MULGOA	Whole Lot 25//752044

Region: 10 - Sydney South Coast
River Basin: 212 - HAWKESBURY RIVER
Area/District:
CMA Map: 9030-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6262724.0
Easting: 286046.0
Latitude: 33°45'14.3"S
Longitude: 150°41'24.2"E

GS Map: -
MGA Zone: 0
Coordinate Source: GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	Concrete Cylnder	-0.40	-0.40	1219			

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
6.00	7.80	1.80	Unconsolidated	6.00		1.89			

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	2.74	2.74	Loam Red	Loam	
2.74	7.92	5.18	Sand Gravel Water Supply	Sand	

Remarks

10/03/1981: 9 WORTH ST PENRITH (LOT 25)

***** End of GW029710 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

NSW Office of Water
Work Summary

GW101178

Licence: 10BL158273 **Licence Status:** CANCELLED

Authorised Purpose(s): TEST BORE
Intended Purpose(s): INDUSTRIAL, RECREATION (GROUNDWATER)

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Rotary Air
Owner Type: Private

Commenced Date:
Completion Date: 15/01/1998
Final Depth: 11.20 m
Drilled Depth: 11.20 m

Contractor Name: INTERTEC DRILLING SERVICES
Driller: Colin Leslie Barden
Assistant Driller:

Property: N/A
GWMA: -
GW Zone: -
Standing Water Level: 8.000
Salinity:
Yield: 0.600

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	1 998482
Licensed:	CUMBERLAND	MULGOA	Whole Lot 90//752044

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6262566.0
Easting: 285844.0
Latitude: 33°45'19.3"S
Longitude: 150°41'16.2"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	6.00	200			Rotary Air
1		Hole	Hole	6.00	11.20	168			Other
1		Annulus	Waterworn/Rounded	-0.80	11.20				Graded, Q:0.100m3
1	1	Casing	Pvc Class 12	-0.80	11.20	114			Seated on Bottom, Glued
1	1	Casing	Steel	-0.80	11.20	168	158		Seated on Bottom, Welded
1	1	Opening	Slots - Vertical	6.20	10.20	168		1	Oxy-Acetylene Slotted, Steel, SL: 100.0mm, A: 2.00mm
1	1	Opening	Screen	7.70	10.70	114		1	PVC Class 12, Glued, A: 0.40mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
6.00	10.50	4.50	Unknown	8.00		0.60	11.20	01:00:00	180.00

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

0.00	2.00	2.00	Sandy clay	Sandy Clay	
2.00	6.00	4.00	Grey sand	Sand	
6.00	10.50	4.50	Coarse gravel and cobbles (water bearing)	Gravel	
10.50	11.20	0.70	Dark grey shale and clay	Shale	

Remarks

15/01/1998: Form A Remarks:
Chlorine added on completion.
19/04/2001: PREVIOUS LIC NO: 10BL158273
22/01/2013: Nat Carling, 22-Jan-2013; Added rock type codes to driller's log & added missing information (based on existing data).

***** End of GW101178 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

NSW Office of Water
Work Summary

GW103048

Licence: 10BL141316 **Licence Status:** CONVERTED

Authorised Purpose(s): RECREATION (GROUNDWATER),INDUSTRIAL
Intended Purpose(s): RECREATION (GROUNDWATER)

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date:
Completion Date: 01/01/1990

Final Depth: 8.00 m
Drilled Depth: 8.00 m

Contractor Name:
Driller:
Assistant Driller:

Property: PENRITH SHOWGROUND 127 - 141 STATION ST PENRITH 2750 NSW
GWMA: -
GW Zone: -

Standing Water Level: 6.000
Salinity:
Yield: 1.000

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	1//998482
Licensed:	CUMBERLAND	MULGOA	Whole Lot 1//998482

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:

CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown

Northing: 6262406.0
Easting: 286110.0

Latitude: 33°45'24.7"S
Longitude: 150°41'26.4"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	8.00	0			Unknown
1	1	Casing	Concrete	0.00	0.00	1200			

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments

Remarks

***** End of GW103048 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

NSW Office of Water
Work Summary

GW108041

Licence: 10BL600263 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date:
Completion Date: 12/04/2006
Final Depth: 7.50 m
Drilled Depth: 7.50 m

Contractor Name:
Driller: Christopher David Kiernan
Assistant Driller:

Property: MOBIL 174 COREEN AVE PENRITH 2750 NSW
GWMA: -
GW Zone: -
Standing Water Level: 6.700
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	81 810416
Licensed:	CUMBERLAND	MULGOA	Whole Lot 81//810416

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6263735.0
Easting: 286724.0
Latitude: 33°44'42.0"S
Longitude: 150°41'51.4"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	7.50	100			Auger
1		Annulus	(Unknown)	0.00	0.00				Graded
1	1	Casing	Pvc Class 18	0.00	4.50	50	42		
1	1	Opening	Slots	4.50	7.50	50		1	Sawn, PVC Class 18

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
6.50	7.50	1.00	Unknown	6.70					

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	CONCRETE	Invalid Code	
0.20	0.40	0.20	CLAY L/BROWN	Invalid Code	
0.40	3.30	2.90	CLAY BECOMING ORANGE,BROWN	Clay	

3.30	7.50	4.20	GRAVEL,BROWN,WELL GRADED	Gravel	

Remarks

***** End of GW108041 *****

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NSW Office of Water
Work Summary

GW108042

Licence: 10BL600263 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date:
Completion Date: 22/04/2006
Final Depth: 8.00 m
Drilled Depth: 8.00 m

Contractor Name:
Driller: Christopher David Kiernan
Assistant Driller:

Property: MOBIL 174 COREEN AVE PENRITH 2750 NSW
GWMA: -
GW Zone: -
Standing Water Level: 6.400
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	81 810416
Licensed:	CUMBERLAND	MULGOA	Whole Lot 81//810416

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6263761.0
Easting: 286759.0
Latitude: 33°44'41.2"S
Longitude: 150°41'52.8"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	8.00	100			Auger
1		Annulus	(Unknown)	4.00	8.00				Graded
1	1	Casing	Pvc Class 18	0.00	5.00	50	42		
1	1	Opening	Slots	5.00	8.00	50		1	Sawn, PVC Class 18

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	CONCRETE	Invalid Code	
0.20	0.30	0.10	FILL,CLAY,GREY/BROWN	Fill	
0.30	2.50	2.20	CLAY,RED/BROWN	Clay	
2.50	7.50	5.00	GRAVELS,WELL GRADED	Gravel	

7.50	8.00	0.50	COARSE GRAINED SAND BANDS	Invalid Code	

Remarks

***** End of GW108042 *****

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NSW Office of Water
Work Summary

GW108043

Licence: 10BL600263 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date:
Completion Date: 22/04/2006
Final Depth: 9.00 m
Drilled Depth: 9.00 m

Contractor Name:
Driller: Christopher David Kiernan
Assistant Driller:

Property: MOBIL 174 COREEN AVE PENRITH 2750 NSW
GWMA: -
GW Zone: -
Standing Water Level: 6.800
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	81 810416
Licensed:	CUMBERLAND	MULGOA	Whole Lot 81//810416

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6263742.0
Easting: 286836.0
Latitude: 33°44'41.9"S
Longitude: 150°41'55.8"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	100			Auger
1		Annulus	(Unknown)	5.00	9.00				Graded
1	1	Casing	Pvc Class 18	0.00	6.00	50	42		
1	1	Opening	Slots	6.00	9.00	50		1	Sawn, PVC Class 18

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
7.00	9.00	2.00	Unknown	6.80					

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	4.80	4.80	CLAYEY SAND	Invalid Code	
4.80	5.40	0.60	SAND,BROWN, LOOSE,DDRY	Sand	
5.40	9.00	3.60	GRAVEL	Gravel	

Remarks

***** End of GW108043 *****

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NSW Office of Water
Work Summary

GW108044

Licence: 10BL600263 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Bore
Work Status:
Construct.Method:
Owner Type:

Commenced Date:
Completion Date: 22/04/2006
Final Depth: 9.50 m
Drilled Depth: 9.50 m

Contractor Name:
Driller: Christopher David Kiernan
Assistant Driller:

Property: MOBIL 174 COREEN AVE PENRITH 2750 NSW
GWMA: -
GW Zone: -
Standing Water Level: 6.600
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	81 810416
Licensed:	CUMBERLAND	MULGOA	Whole Lot 81//810416

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6263767.0
Easting: 286812.0
Latitude: 33°44'41.1"S
Longitude: 150°41'54.8"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.50	100			Auger
1		Annulus	(Unknown)	6.00	9.50				Graded
1	1	Casing	Pvc Class 18	0.00	6.50	50	42		
1	1	Opening	Slots	6.50	9.50	50		1	Sawn, PVC Class 18

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
8.20	9.50	1.30	Unknown	6.60					

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.20	0.20	CONCRETE	Invalid Code	
0.20	0.30	0.10	FILL,CLAY,GREY	Fill	
0.30	6.40	6.10	SILTY CLAYEY SAND,ORANGE,BROWN	Invalid Code	

6.40	9.50	3.10	GRAVELS,WET,MODERATE	Gravel	

Remarks

***** End of GW108044 *****

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NSW Office of Water
Work Summary

GW108484

Licence: 10BL163999 **Licence Status:** CONVERTED

Authorised Purpose(s): RECREATION (GROUNDWATER),INDUSTRIAL
Intended Purpose(s): RECREATION (GROUNDWATER)

Work Type: Well
Work Status:
Construct.Method: Rotary Air
Owner Type: Private

Commenced Date:
Completion Date: 06/09/2006
Final Depth: 11.00 m
Drilled Depth: 11.00 m

Contractor Name: Ultra Drilling
Driller: Peter Edward Davidson
Assistant Driller:

Property: PENRITH HARNESS TRACK 119 STATION ST PENRITH 2750 NSW
GWMA:
GW Zone:
Standing Water Level:
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	1//998482
Licensed:			

Region: 10 - Sydney South Coast
River Basin: - Unknown
Area/District:
CMA Map:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6262409.0
Easting: 285738.0
Latitude: 33°45'24.3"S
Longitude: 150°41'12.0"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	11.00	171			Rotary Air
1	1	Casing	Steel	0.30	8.00	168	158		Driven into Hole, Welded
1	1	Opening	Screen	8.00	11.00	125		1	Steel, Packer, A: 0.50mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	6.00	6.00	CLAY	Clay	
6.00	8.50	2.50	SAND	Sand	
8.50	11.00	2.50	GRAVEL	Gravel	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Remarks

***** End of GW108484 *****

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NSW Office of Water
Work Summary

GW111987

Licence: 10BL603225 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Well
Work Status: Equipped
Construct.Method: Auger - Solid Flight
Owner Type: Private

Commenced Date:
Completion Date: 24/03/2010
Final Depth: 9.00 m
Drilled Depth: 9.00 m

Contractor Name: NUMAC
Driller: Christopher Mcmullen
Assistant Driller:

Property: WOOLWORTHS PETROL DIVISION CORNER WORTH AND HIGH STREET PENRITH 2750 NSW
Standing Water Level:
GWMA:
GW Zone:
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	3//541045
Licensed:			

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Area/District:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6262887.0
Easting: 286130.0
Latitude: 33°45'09.1"S
Longitude: 150°41'27.6"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	125			Auger - Solid Flight
1		Annulus	Waterworn/Rounded	0.00	0.00				Graded
1	1	Casing	Pvc Class 18	0.00	6.00	60	50		Seated on Bottom, Other
1	1	Opening	Slots - Horizontal	6.00	9.00	60		1	Casing - Machine Slotted, PVC Class 18, Other, SL: 40.0mm, A: 3.80mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
7.50	9.00	1.50	Unknown						

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.00	3.00	CLAY MINOR SAND RED BROWN	Clay	

3.00	9.00	6.00	GRAVEL WITH MINOR SAND	Gravel	

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status & fixed drillers log errors.

***** End of GW111987 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

NSW Office of Water
Work Summary

GW111988

Licence: 10BL603225 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Well
Work Status: Equipped
Construct.Method: Auger - Solid Flight
Owner Type: Private

Commenced Date:
Completion Date: 24/03/2010
Final Depth: 9.00 m
Drilled Depth: 9.00 m

Contractor Name: Numac Drilling Services
Driller: Christopher Mcmullen
Assistant Driller:

Property: WOOLWORTHS PETROL DIVISION CORNER WORTH AND HIGH STREET PENRITH 2750 NSW
Standing Water Level:
GWMA:
GW Zone:
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	3//541045
Licensed:			

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Area/District:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6262904.0
Easting: 286134.0
Latitude: 33°45'08.6"S
Longitude: 150°41'27.7"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	125			Auger - Solid Flight
1		Annulus	Waterworn/Rounded	0.00	0.00				Graded
1	1	Casing	Pvc Class 18	0.00	6.00	60	50		Seated on Bottom
1	1	Opening	Slots - Horizontal	6.00	9.00	60		1	Casing - Machine Slotted, PVC Class 18, Other, SL: 40.0mm, A: 3.80mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
7.50	9.00	1.50	Unknown						

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.00	3.00	CLAY MINOR SAND RED BROWN	Clay	

3.00	9.00	6.00	GRAVEL WITH MINOR SAND	Gravel	

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status & fixed drillers log errors.

***** End of GW111988 *****

Warning To Clients: This raw data has been supplied to the NSW Office of Water by drillers, licensees and other sources. The NOW does not verify the accuracy of this data. The data is presented for use by you at your own risk. You should consider verifying this data before relying on it. Professional hydrogeological advice should be sought in interpreting and using this data.

NSW Office of Water
Work Summary

GW111989

Licence: 10BL603225 **Licence Status:** ACTIVE

Authorised Purpose(s): MONITORING BORE
Intended Purpose(s): MONITORING BORE

Work Type: Well
Work Status: Equipped
Construct.Method: Auger - Solid Flight
Owner Type: Private

Commenced Date:
Completion Date: 24/03/2010
Final Depth: 9.00 m
Drilled Depth: 9.00 m

Contractor Name: Numac Drilling Services
Driller: Christopher Mcmullen
Assistant Driller:

Property: WOOLWORTHS PETROL DIVISION CORNER WORTH AND HIGH STREET PENRITH 2750 NSW
Standing Water Level:
GWMA:
GW Zone:
Salinity:
Yield:

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.34	3//541045
Licensed:			

Region: 10 - Sydney South Coast
CMA Map:
River Basin: - Unknown
Area/District:
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6262897.0
Easting: 286157.0
Latitude: 33°45'08.8"S
Longitude: 150°41'28.7"E

GS Map: -
MGA Zone: 0
Coordinate Source: Unknown

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	9.00	125			Auger - Solid Flight
1		Annulus	Waterworn/Rounded	0.00	0.00				Graded
1	1	Casing	Pvc Class 18	0.00	6.00	60	50		Seated on Bottom, Other
1	1	Opening	Slots - Horizontal	6.00	9.00	60		1	Casing - Machine Slotted, PVC Class 18, Other, SL: 40.0mm, A: 3.80mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
7.50	9.00	1.50	Unknown						

Geologists Log
Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.00	3.00	CLAY MINOR SAND RED BROWN	Clay	

3.00	9.00	6.00	GRAVEL WITH MINOR SAND	Gravel	

Remarks

17/07/2014: Nat Carling, 17-July-2014; Updated status & fixed drillers log errors.

***** End of GW111989 *****

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Appendix C EPA Records

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Home Contaminated land Record of notices

Search results

Your search for:Suburb: PENRITH

Matched 6 notices relating to 1 site.

Search Again

Refine Search

Suburb	Address	Site Name	Notices related to this site
PENRITH	Castlereagh ROAD	Crane Enfield Metals	3 current and 3 former

Page 1 of 1

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Version: 1, Version Date: 14/04/2021

List of NSW Contaminated Sites Notified to EPA as of 22 December 2017

Background

A strategy to systematically assess, prioritise and respond to notifications under Section 60 of the *Contaminated Land Management Act 1997* (CLM Act) has been developed by the EPA. This strategy acknowledges the EPA's obligations to make information available to the public under *Government Information (Public Access) Act 2009*.

When a site is notified to the EPA, it may be accompanied by detailed site reports where the owner has been proactive in addressing the contamination and its source. However, often there is minimal information on the nature or extent of the contamination.

For some notifications, the information indicates the contamination is securely immobilised within the site, such as under a building or carpark, and is not currently causing any offsite consequences to the community or environment. Such sites would still need to be cleaned up, but this could be done in conjunction with any subsequent building or redevelopment of the land. These sites may not require intervention under the CLM Act, but could be dealt with through the planning and development consent process.

Where indications are that the nominated site is causing actual harm to the environment or an unacceptable offsite impact (i.e. it is a "significantly contaminated site"), the EPA would apply the regulatory provisions of the CLM Act to have the responsible polluter and/or landowner investigate and remediate the site.

As such, the sites notified to the EPA and presented in the following table are at various stages of the assessment and/or remediation process. Understanding the nature of the underlying contamination, its implications and implementing a remediation program where required, can take a considerable period of time. The tables provide an indication, in relation to each nominated site, as to the management status of that particular site. Further detailed information may be available from the EPA or the responsible landowner.

The following questions and answers may assist those interested in this issue:

Frequently asked questions

What is the difference between the "List of NSW Contaminated Sites Notified to the EPA" and the "Contaminated Land: Record of Notices"?

A site will be on the Contaminated Land: Record of Notices only if the EPA has issued a regulatory notice in relation to the site under the *Contaminated Land Management Act 1997*.

The sites appearing on this "List of NSW contaminated sites notified to the EPA" indicate that the notifiers consider that the sites are contaminated and warrant reporting to the EPA. However, the contamination may or may not be significant enough to warrant regulation by the EPA. The EPA needs to review and, if necessary, obtain more information before it can make a determination as to whether the site warrants regulation.

Why my site appears on the list?

Your site appears on the list because of one or more of the following reasons:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- The site owner and/or the person partly or fully responsible for causing the contamination notified to the EPA about the contamination under Section 60 of the *Contaminated Land Management Act 1997*. In other words, the site owner or the "polluter" believes the site is contaminated.
- The EPA has been notified via other means and is satisfied that the site is or was contaminated.

Does the list contain all contaminated sites in NSW?

No. The list only contains contaminated sites that the EPA is aware of, with regard to its regulatory role under the CLM Act. An absence of a site from the list does not necessarily imply the site is not contaminated.

The EPA relies upon responsible parties to notify contaminated sites.

How are these notified contaminated sites managed by the EPA?

There are different ways that the EPA manages these notified contaminated sites. First, an initial assessment is carried out by the EPA. At the completion of the initial assessment, the EPA may take one or more than one of the following management approaches:

- The contamination warrants the EPA's direct regulatory intervention either under the *Contaminated Land Management Act 1997* or the *Protection of the Environment Operations Act 1997* (POEO Act), or both. Information about current or past regulatory action on this site can be found on EPA website.
- The contamination with respect to the current use or approved use of the site, as defined under the *Contaminated Land Management Act 1997,* is not significant enough that it warrants EPA regulation.
- The contamination does not require EPA regulation and can be managed by a planning approval process.
- The contamination is related to an operational Underground Petroleum Storage System, such as a service station or fuel depot. The contamination may be managed under the POEO Act and the Protection of the Environment Operation (Underground Petroleum Storage Systems) Regulation 2008.
- The contamination is being managed under a specifically tailored program operated by another agency (for example the Department of Industry and Investment's *Derelict Mines Program*).

I am the owner of a site that appears on the list. What should I do?

First of all, you should ensure the current use of the site is compatible with the site contamination. Secondly, if the site is the subject of EPA regulation, make sure you comply with the regulatory requirements, and you have considered your obligations to notify other parties who may be affected.

If you have any concerns, contact us and we may be able to offer you general advice, or direct you to accredited professionals who can assist with specific issues.

I am a prospective buyer of a site that appears on the list. What should I do?

You should seek advice from the vendor to put the contamination issue into perspective. You may need to seek independent expert advice.

The information provided in the list is meant to be indicative only, and a starting point for your own assessment. Site contamination as a legacy of past site uses is not uncommon,

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

particularly in an urbanised environment. If the contamination on a site is properly remediated or managed, it may not materially impact upon the intended future use of the site. However, each site needs to be considered in context.

List of NSW Contaminated Sites Notified to the EPA

Disclaimer

The EPA has taken all reasonable care to ensure that the information in the list of contaminated sites notified to the EPA (the list) is complete and correct. The EPA does not, however, warrant or represent that the list is free from errors or omissions or that it is exhaustive.

The EPA may, without notice, change any or all of the information in the list at any time.

You should obtain independent advice before you make any decision based on the information in the list.

The list is made available on the understanding that the EPA, its servants and agents, to the extent permitted by law, accept no responsibility for any damage, cost, loss or expense incurred by you as a result of:

1. any information in the list; or
2. any error, omission or misrepresentation in the list; or
3. any malfunction or failure to function of the list;
4. without limiting (2) or (3) above, any delay, failure or error in recording, displaying or updating information.

Site Status	Explanation
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or *Protection of the Environment Operations Act 1997*. Alternatively, the EPA may require information via a notice issued under s77 of the *Contaminated Land Management Act 1997* or issue a Preliminary Investigation Order.
Regulation under CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the *Contaminated Land Management Act 1997* is not required.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997*. A regulatory approach is being finalised.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the *Protection of the Environment Operations Act 1997* (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the *Environmental Planning and Assessment Act 1979* (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the *Protection of the Environment Operations Act 1997* (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the *Environmental Planning and Assessment Act 1979* (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the *Contaminated Land Management Act 1997* (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Suburb	Site Name	Site Address	Contamination Activity Type	EPA Management Class	Latitude	Longitude
PAMBULA	Offsite area (roadways) adjacent to United Service Station	Corner Quondola Street and Bullara STREET	Service Station	Regulation under CLM Act not required	-36.93104481	149.8746763
PARKES	BP Reliance East End Service Station Parkes	46 Clarinda STREET	Service Station	Regulation under CLM Act not required	-33.14243539	148.1846227
PARKES	BP Truckstop	(Newell Highway) 1 Forbes ROAD	Other Petroleum	Regulation under CLM Act not required	-33.14309226	148.1710282
PARKES	Caltex Service Station Parkes	352-360 Clarinda STREET	Service Station	Regulation under CLM Act not required	-33.13317454	148.173643
PARKES	Former BP Telescope Service Station	339-341 Clarinda STREET	Service Station	Regulation under CLM Act not required	-33.13216152	148.1743239
PARKES	Former Caltex Parkes (Mugincoble) Depot - Eugowra	Eugowra ROAD	Service Station	Regulation under CLM Act not required	-33.19007031	148.224822
PARKLEA	Caltex Parklea Service Station	Old Windsor (north of Miami Street) ROAD	Service Station	Regulation under CLM Act not required	-33.72427108	150.9388531
PARRAMATTA	7-Eleven (former Mobil) Service Station	81 Victoria ROAD	Service Station	Regulation under CLM Act not required	-33.80919769	151.0142894
PARRAMATTA	BP Service Station	435 Church STREET	Service Station	Regulation under CLM Act not required	-33.80498714	151.0056151
PARRAMATTA	Coleman Oval Embankment	Cnr of Pitt STREET and Maquarie STREET	Unclassified	Regulation under CLM Act not required	-33.80441625	150.9954841
PARRAMATTA	Parramatta Park Toilet Block Demolition	The Cresent Toilet Block Parramatta PARK	Unclassified	Regulation under CLM Act not required	-33.81054034	150.9961968
PAUPONG	Former Timber Treatment Plant	Off Paupong ROAD	Other Industry	Regulation under CLM Act not required	-36.57657408	148.6624998
PENDLE HILL	7-Eleven Service Station	217 Wentworth AVENUE	Service Station	Regulation under CLM Act not required	-33.8017814	150.9577994
PENNANT HILLS	Shell Coles Express Pennant Hills West	386 Pennant Hills ROAD	Service Station	Contamination currently regulated under CLM Act	-33.73936462	151.0680237
PENRITH	7-Eleven (former Mobil) Service Station	212-222 Andrews ROAD	Service Station	Regulation under CLM Act not required	-33.73059678	150.6952571
PENRITH	7-Eleven Service Station Penrith	30 Henry STREET	Service Station	Regulation under CLM Act not required	-33.75408799	150.7045594
PENRITH	BP Express Service Station	Corner Coreen Avenue and Castlereagh ROAD	Service Station	Regulation under CLM Act not required	-33.74385498	150.6925743
PENRITH	Caltex Penrith Service Station	153 Coreen AVENUE	Service Station	Regulation under CLM Act not required	-33.74287244	150.6927071
PENRITH	Caltex Service Station	Castlereagh Rd Cnr Lugard STREET	Service Station	Regulation under CLM Act not required	-33.73426843	150.6933382
PENRITH	Crane Enfield Metals	Castlereagh ROAD	Metal Industry	Contamination currently regulated under CLM Act	-33.73734959	150.696442
PENRITH	Jet 60 Dry Cleaners	Shop 3 134-138 Henry STREET	Unclassified	Under assessment	-33.75231953	150.6964541
PENRITH	Lowes Petroleum (Former Mobil) Depot Penrith	174 Coreen AVENUE	Other Petroleum	Regulation under CLM Act not required	-33.74484268	150.6980504
PENRITH	Mirvac Industrial Site	2101 Castlereagh ROAD	Other Industry	Regulation under CLM Act not required	-33.73497514	150.6954097
PENSHURST	7-Eleven Service Station	612 Forest ROAD	Service Station	Regulation under CLM Act not required	-33.96153533	151.0793525
PENSHURST	Caltex Service Station	641 King Georges ROAD	Service Station	Regulation under CLM Act not required	-33.95985335	151.0891118

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Search results

Your search for: **General Search** with the following criteria

Suburb - PENRITH

returned 77 results

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Number	Name	Location	Type	Status	Issued date
6357	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	POEO licence	Issued	07 Jun 2000
1007008	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	05 Jul 2002
1020003	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	09 Sep 2002
1072516	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	20 Aug 2007
1085783	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	21 Oct 2008
1104746	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	06 Aug 2009
1109805	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26 Feb 2010
1512576	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	12 Aug 2014
247	BORAL RESOURCES (NSW) PTY LTD	PEACHTREE ROAD, PENRITH, NSW 2750	POEO licence	No longer in force	22 Aug 2000
12405	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	09 Mar 2006
1070974	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	30 Jul 2007
1077652	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	31 Aug 2007
1109988	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19 Apr 2010
1525967	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	31 Oct 2014
1526072	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	11 Nov 2014
1098	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	26 Jun 2000
1017498	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	24 Nov 2003
1072470	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	20 Sep 2007
1104995	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	04 Nov 2009
1512789	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	Compliance Audit	Complete	13 Mar 2013

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Search results

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returned 77 results

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Number	Name	Location	Type	Status	Issued date
1512775	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19 Mar 2013
1515690	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26 Jul 2013
1525217	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26 Sep 2014
10945	CUMMINS SOUTH PACIFIC PTY. LTD.	7 Andrews Road, PENRITH, NSW 2750	POEO licence	Surrendered	19 Jun 2000
1035208	CUMMINS SOUTH PACIFIC PTY. LTD.	7 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	08 Mar 2004
308	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	17 Jan 2000
1024084	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	06 Jan 2003
1044228	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	08 Feb 2005
11290	ENDEAVOUR ENERGY	96-120 Blaikie Road, PENRITH, NSW 2750	POEO licence	No longer in force	08 Jan 2001
1035197	ENDEAVOUR ENERGY	96-120 Blaikie Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	08 Mar 2004
1526441	Glass Recovery Services Pty Ltd	126 Andrews Road, PENRITH, NSW 2740	s.91 Clean Up Notice	Issued	27 Jan 2015
1535765	Glass Recovery Services Pty Ltd	126 Andrews Road, PENRITH, NSW 2740	s.91 Clean Up Notice	Issued	23 Aug 2016
3085780565	Glass Recovery Services Pty Ltd	126 Andrews Road, PENRITH, NSW 2740	Penalty Notice	Issued	28 Oct 2016
20381	Glass Recovery Services Pty Ltd	126 Andrews Road, PENRITH, NSW 2740	POEO licence	Issued	07 Nov 2017
12132	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750	POEO licence	Surrendered	01 Oct 2004
1097227	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750	s.58 Licence Variation	Issued	02 Feb 2009
1104874	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750	s.58 Licence Variation	Issued	17 Aug 2009
6472	JAMES KEITH COSGROVE	8 HOYLE PLACE, PENRITH, NSW 2750	POEO licence	Surrendered	21 Jun 2000
1044521	JAMES KEITH COSGROVE	8 HOYLE PLACE, PENRITH, NSW 2750	s.58 Licence Variation	Issued	16 Feb 2005
7019	JAMISON PRIVATE HOSPITAL PROPERTY PTY LTD	366 JAMISON ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	20 Mar 2001

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Search results

Your search for: **General Search** with the following criteria

Suburb - PENRITH

returned 77 results

Export to excel 3 of 4 Pages Search Again

Number	Name	Location	Type	Status	Issued date
2869	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	05 Jun 2000
1012903	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	18 Feb 2002
1525246	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	02 Oct 2014
1556498	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.96 Prevention Notice	Issued	08 Sep 2017
3741	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	31 Jan 2001
1007235	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	10 May 2001
1008444	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	20 Aug 2001
2818	PANASONIC AVC NETWORKS AUSTRALIA PTY LTD	164 STATION STREET, PENRITH, NSW 2750	POEO licence	Surrendered	24 Mar 2000
1048338	PANASONIC AVC NETWORKS AUSTRALIA PTY LTD	164 STATION STREET, PENRITH, NSW 2750	s.58 Licence Variation	Issued	31 May 2005
10349	SYDNEY OLYMPIC PARK AUTHORITY	CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	06 Jan 2000
1409	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	25 May 2000
1005313	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	22 Oct 2001
1017898	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26 Jun 2002
1018895	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	23 Dec 2002
1028330	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	08 Jul 2003
1032690	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	25 Nov 2003
1032982	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19 Mar 2004
1047700	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	30 Jun 2005
1061410	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	29 Jun 2006
1074754	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	27 Jun 2007

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12 February 2018

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Search results

Your search for: **General Search** with the following criteria

Suburb - PENRITH

returned 77 results

Export to excel 4 of 4 Pages Search Again

Number	Name	Location	Type	Status	Issued date
1116048	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	02 Jul 2010
1129012	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	27 Jun 2011
1504851	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	28 Jun 2012
1528922	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	23 Mar 2015
1538189	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19 Feb 2016
11461	TOTAL CONCRETE SOLUTIONS PTY LIMITED	261 COOMBES DRIVE, PENRITH, NSW 2750	POEO licence	No longer in force	19 Oct 2001
1294	VICARY CORPORATION PTY LIMITED	60-62 REGENTVILLE ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	22 Aug 2000
12106	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	POEO licence	Surrendered	28 Apr 2004
1042219	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	10 Nov 2004
1065654	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	25 Oct 2006
1093267	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	10 Nov 2008
1127751	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	03 Jun 2011
5269	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	10 Aug 2000
1066270	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	15 Dec 2006
1072508	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	23 Jul 2007
1100623	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	07 Oct 2009
1526064	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	11 Nov 2014

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Appendix D Australian and NSW Heritage Data Base Searches

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Search Results

9 results found.

Blacktown Native Institution Site Richmond Rd	Oakhurst, NSW, Australia	(Nomination now ineligible for PPAL) National Heritage List
Combewood, Outbuildings and Garden 306 RMB Castlereagh Rd	Penrith, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Museum of Fire Castlereagh Rd	Penrith, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Penrith Courthouse (former) High St	Penrith, NSW, Australia	(Destroyed) Register of the National Estate (Non-statutory archive)
St Stephens Anglican Church & Graveyard 252 High St	Penrith, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Thornton Hall & Surrounds 11 Mountain View Cr	Penrith, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)
Thornton Hall & Surrounds 11 Mountain View Cr	Penrith, NSW, Australia	(Place removed from CHL) Commonwealth Heritage List
Thornton Hall and Surrounds (former Defence land) 11 Mountain View Cr	Penrith, NSW, Australia	(Place removed from CHL) Commonwealth Heritage List
Victoria Bridge Great Western Hwy	Penrith, NSW, Australia	(Registered) Register of the National Estate (Non-statutory archive)

Report Produced: Thu Feb 15 09:33:34 2018

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Office of Environment & Heritage

Home > Topics > Heritage places and items > Search for heritage

Search for NSW heritage

Return to search page where you can refine/broaden your search.

Statutory listed items

Information and items listed in the State Heritage Inventory come from a number of sources. This means that there may be several entries for the same heritage item in the database. For clarity, the search results have been divided into three sections.

- **Section 1** - contains Aboriginal Places declared by the **Minister for the Environment** under the National Parks and Wildlife Act. This information is provided by the Heritage Division.
- **Section 2** - contains heritage items listed by the **Heritage Council of NSW** under the NSW Heritage Act. This includes listing on the State Heritage Register, an Interim Heritage Order or protected under section 136 of the NSW Heritage Act. This information is provided by the Heritage Division.
- **Section 3** - contains items listed by **local councils** on Local Environmental Plans under the Environmental Planning and Assessment Act, 1979 and **State government agencies** under s.170 of the Heritage Act. This information is provided by local councils and State government agencies.

Section 1. Aboriginal Places listed under the National Parks and Wildlife Act.

Your search did not return any matching results.

Section 2. Items listed under the NSW Heritage Act.

Your search returned 14 records.

Item name	Address	Suburb	LGA	SHR
Ahrens Fox PS2 Fire Engine (1929)	1 Museum Drive	Penrith	Penrith	01717
Craithes House	34-40 Borec Road	Penrith	Penrith	00378
Dennis Big 6 Fire Engine (1939)	1 Museum Drive	Penrith	Penrith	01718
Edward Smith Headquarters Switchboard (1909)	1 Museum Drive	Penrith	Penrith	01901
Emu Plains (Nepean River) Underbridge	Off Bruce Neale Dr, Steel Trusses 1.3 Km Past Station	Penrith	Penrith	01830
Fire and Rescue NSW Heritage Fleet	Museum Drive	Penrith	Penrith	01902
Ford 21W Fire Brigade Mobile Canteen (1942)	Museum Drive	Penrith	Penrith	01900
NSW Fire Brigades No 10 Vehicle Number Plates	Castlereagh Road	Penrith	Penrith	01519
Penrith Railway Station group	Great Western Railway	Penrith	Penrith	01222

Document ID: 2547329
Version: 1, Version Date: 14/04/2021

Shand Mason 7 inch Manual Fire Engine (1869)	1 Museum Drive	Penrith	Penrith	01898
Shand Mason Curricle Ladders (1898)	1 Museum Drive	Penrith	Penrith	01899
Shand Mason Fire Engine (1891)	Museum Drive	Penrith	Penrith	01716
Torin Building	26 Coombes Drive	Penrith	Penrith	01796
Victoria Bridge	Nepean River, Great Western Highway	Penrith	Penrith	01950

Section 3. Items listed by Local Government and State Agencies.

Your search returned 68 records.

Item name	Address	Suburb	LGA	Information source
1841 Tilley 5 inch Manual Fire Engine	1 Museum Drive	Penrith	Penrith	SGOV
1869 Shand Mason 7" Manual Fire Engine	1 Museum Drive	Penrith	Penrith	SGOV
1891 Shand Mason Steamer Fire Engine	1 Museum Drive	Penrith	Penrith	SGOV
1898 Shand Mason Curricle Ladders - Fire Engine	1 Museum Drive	Penrith	Penrith	SGOV
1916 Garford Type 64 Chain Drive Fire Engine	1 Museum Drive	Penrith	Penrith	SGOV
1929 Ahrens Fox PS2 Fire Engine	1 Museum Drive	Penrith	Penrith	SGOV
1939 Dennis Big 6 Fire Engine	1 Museum Drive	Penrith	Penrith	SGOV
1942 Ford 21W Fire Brigade Mobile Canteen	1 Museum Drive	Penrith	Penrith	SGOV
1949 Dennis F1 Fire Engine (Scout Car)	1 Museum Drive	Penrith	Penrith	SGOV
Avenue and Garden Planting	Lemko Place	Penrith	Penrith	LGOV
Broadville Victorian House	98 Station Street	Penrith	Penrith	LGOV
Combewood House, garden and original entrance	Coreen Avenue	Penrith	Penrith	LGOV
Combewood Trees	Coreen Avenue	Penrith	Penrith	LGOV
Commissioner's Uniform (NSWFire	1 Museum Drive	Penrith	Penr	SGOV

Document Set ID: 9547378
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Brigades) - Ian Mac Dougall			ith	
Craithes House	Borec Road	Penrith	Penrith	LGOV
Cram Place - Cast Iron Fence	338-340 High Street	Penrith	Penrith	LGOV
Cram Place - Well and Pump	338-340 High Street	Penrith	Penrith	LGOV
Cram Place (Former CBC Bank)	338-340 High Street	Penrith	Penrith	LGOV
Cram Place (Former Coach House)	338-340 High Street	Penrith	Penrith	LGOV
Derby Street P33b Conservation Area Cottages	Castlereagh Street	Penrith	Penrith	LGOV
Derby Street P33c Conservation Area Cottages	Derby Street	Penrith	Penrith	LGOV
Dunheved Fire Station	50 Christie Street	Penrith	Penrith	SGOV
Edward Smith Headquarters Switchboard - 1909	1 Museum Drive	Penrith	Penrith	SGOV
Edwardian Cottage	323 Castlereagh Road	Penrith	Penrith	LGOV
Emu Plains (Nepean River) Underbridge	Off Bruce Neale Dr, Steel Trusses 1.3 Km Past Station	Penrith	Penrith	SGOV
Explorers Memorial	Memorial Avenue	Penrith	Penrith	LGOV
Governor Phillip Special Hospital Original Building	Glebe Place	Penrith	Penrith	LGOV
Kentucky	146 Station Street	Penrith	Penrith	LGOV
Memorial Park	Woodriff Street	Penrith	Penrith	LGOV
Methodist Church (Former)	Henry Street	Penrith	Penrith	LGOV
Museum of Fire Penrith (Former Penrith Power Station)	Castlereagh Road	Penrith	Penrith	LGOV
Nepean River		Penrith	Penrith	LGOV
NSW Fire Brigades Heritage Fleet	1 Museum Drive	Penrith	Penrith	SGOV
NSWFB 'No. 10' Vehicle Number Plates	1 Museum Drive	Penrith	Penrith	SGOV
Original building	Glebe Place	Penrith	Penrith	SGOV

Document Set ID: 9547378
Version: 1, Version Date: 14/04/2021

Peach Tree Creek Bridge	Great Western Highway	Penrith	Penrith	SGOV
Penrith Ambulance Station	668 High Street	Penrith	Wentworth	SGOV
Penrith Ambulance Station	High Street	Penrith	Penrith	LGOV
Penrith Council Chambers	Henry Street	Penrith	Penrith	LGOV
Penrith Infants Department	Henry Street	Penrith	Penrith	LGOV
Penrith Public School Building	High Street	Penrith	Penrith	LGOV
Penrith Public School Palm Trees	High Street	Penrith	Penrith	LGOV
Penrith Railway Station	Jane Street	Penrith	Penrith	LGOV
Penrith Railway Station Group and Residence	Station Street	Penrith	Penrith	SGOV
Penrith Weir	Nepean River	Penrith	Penrith	SGOV
Rectory (Former)	95 Glebe Place	Penrith	Penrith	LGOV
St Aubin's Terrace	255-265 High Street	Penrith	Penrith	LGOV
St. Stehens Cemetery	252 High Street	Penrith	Penrith	LGOV
St. Stephens Church Hall	252 High Street	Penrith	Penrith	LGOV
St. Stephens Church of England	252 High Street	Penrith	Penrith	LGOV
Station Masters House (Former)	57 Belmore Street	Penrith	Penrith	LGOV
The Cottage	39 Warwick Street	Penrith	Penrith	LGOV
The Lodge	54 Camden Road	Penrith	Penrith	LGOV
Thornton Hall	Mountain View Crescent	Penrith	Penrith	LGOV
Timber Cottage	71 Parker Street	Penrith	Penrith	LGOV
Tree - The Cottage	39 Warwick Street	Penrith	Penrith	LGOV
Tree to Victorian House	48 Warwick Street	Penrith	Penr	LGOV

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

			ith	
Two Storey Brick Cottage (Destroyed)	7 Lawson Street	Penrith	Penrith	LGOV
Victoria Bridge	Great Western Highway	Penrith	Penrith	LGOV
Victoria Bridge	Great Western Highway	Penrith	Penrith	GAZ
Victoria Bridge over Nepean River	Great Western Highway	Penrith	Penrith	SGOV
Victorian House	148 Station Street	Penrith	Penrith	LGOV
Victorian House	48 Warwick Street	Penrith	Penrith	LGOV
Victorian House	322 Castlereagh Road	Penrith	Penrith	LGOV
Victorian House	6 Rawson Avenue	Penrith	Penrith	LGOV
Victorian Terrace	219-221 High Street	Penrith	Penrith	LGOV
Victorian Villa	150 Lethbridge Street	Penrith	Penrith	LGOV
Weir and Former Pumping Station	Memorial Avenue	Penrith	Penrith	LGOV

There was a total of 82 records matching your search criteria.

Key:
LGA = Local Government Area
GAZ= NSW Government Gazette (statutory listings prior to 1997), HGA = Heritage Grant Application, HS = Heritage Study, LGOV = Local Government, SGOV = State Government Agency.
Note: While the Heritage Division seeks to keep the Inventory up to date, it is reliant on State agencies and local councils to provide their data. Always check with the relevant State agency or local council for the most up-to-date information.

Document: SEVEN-9547329
Version: 1, Version Date: 14/04/2021

Appendix E Site Layout, Council Development Application and Building Application Records

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Plate 7. Internal view of Shop 3.

Plate 8. View of the clothes press, rotor cupboard and dry cleaning machines within Shop 3.

Plate 9. Cleaning cupboard in the back of Shop 3 showing chemical storage.

Plate 10. Water Boiler within Shop 3.

Document Set ID: 5947979
Version: 1, Version Date: 14/04/2021

PENRITH CITY COUNCIL
-8 SEP 1977

Vac Unit attached to wall inside building above Blow Down Tanks.

AIR VAC UNIT WALL MOUNTED

W.C.

ELECTRIC BOILER

FEED WATER PUMP

BLOW DOWN TANK

STEAM IRON

AJAX 646 PRESS

AJAX TOPPER

AIR COMPRESSOR IN THIS AREA

HUERSCH CABINET

UTILITY PRESS

INDEX CONVEYOR

RENZACCI Royal 40

SPOTTING BOARD

HENRY ST

GAYMARK LANE

PROPOSED LAYOUT:- JET 60 MIN D/C

L. DEE PTY. LTD. SEPT. 77.

SCALE ½ inch = 1 foot.

Application No. 9796923 Created on Jan 16, 2018 2:30:35 PM

SEWERAGE SERVICE DIAGRAM

MUNICIPALITY OF PENRITH SUBURB OF PENRITH Copy of WATER BOARD Diagram No. 4609252

PROPERTY/RATE NO 4609252 SEWER REF.SHEET NUMBER SCALE 1:500

SYMBOLS AND ABBREVIATIONS

INDICATES - DRAINAGE FITTINGS

■		Manhole	⊠ P		P. Trap
□	Chr	Chamber	▮ R		Reflux Valve
○	L.H.	Lamphole	—o—		Cleaning Eye
M		Boundary Trap	○ Vert.		Vertical Pipe
●		Inspection Shaft	IP		Induct Pipe
■	Pit	Pit	MF		Mica Flap
⊠	G	Grease Interceptor	Jn.		Junction
⊠		Gully	• RP		Rodding Point

INDICATES - PLUMBING FIXTURES & OR FITTINGS

CO		Clear Out	Bid		Bidet
○	V	Vent Pipe	S		Shower
T		Tubs	DW.		Dishwasher
K		Kitchen Sink	F		Floor Waste
W		Water Closet	M		Washing Machine
B		Bath Waste	B		Bar Sink
H		Handbasin	L		Lab Sink

INDICATES-PLUMBING ON MORE THAN ONE LEVEL

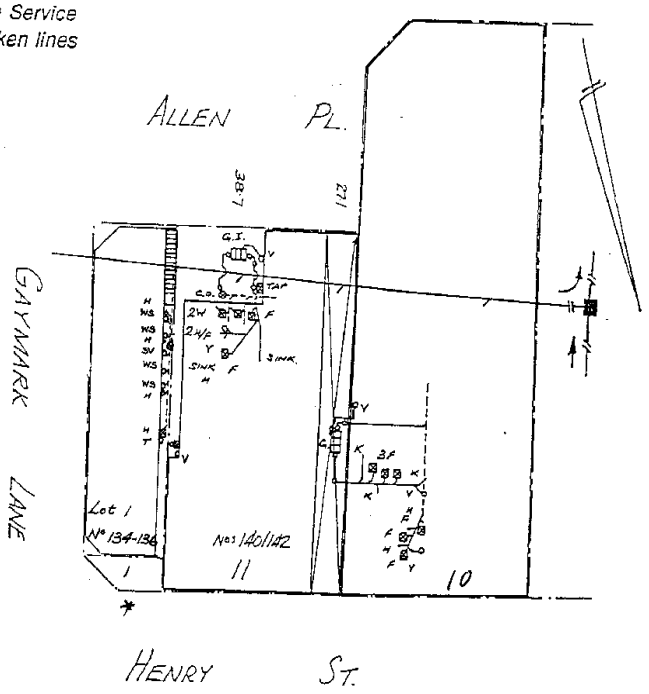
○ SV Soil Vent Pipe ○ WS Waste Stack

SEWER AVAILABLE

Where the sewer is not available and a special inspection is involved the board accepts no responsibility for the suitability of the drainage in relation to the eventual position of the Board's sewer. The existence and position of the Board's sewers, stormwater channels, pipes, mains and structures should be ascertained by inspection of records available at Board's Business Offices. (Section 33 of Board's Act). Position of structures, boundaries, sewers and sewerage service shown hereon are approximate only and in general the outlines of buildings may have been drawn from initial building plans submitted to the Board. Discrepancies in outline can occur from amendment to these plans. Discrepancies in position and type of drainage lines and fittings can be due to unnotified work. Before building work is commenced location of drainage lines is recommended. Licensee is required to submit to the Board a Certificate of Compliance as not all work may have been supervised.

NOTE: This diagram only indicates availability of a sewer and any sewerage service shown as existing in Board's records (By-law 8, Clause 3).

Note: Position of House Service Drainage shown by broken lines is assumed.



CONNECTION POINT Depth.....m

Junction.....m from DS/US Manhole

.....S/L.....m

Inlet into Manhole

Connection Date:...../...../.....

...../...../.....

For Regional Manager

NOTE This diagram only indicates availability of a sewer and any sewerage service shown as existing in Sydney Water's records. The existence and position of Sydney Water's sewers, stormwater channels, pipes, mains and structures should be ascertained by inspection of maps available at any of Sydney Water's Customer Centres. Position of structures, boundaries, sewers and sewerage services shown hereon are approximately only.

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Version: 1, Version Date: 14/04/2021

A3

BELMORE

HENRY

ALLEN

STATION

GAYMARK LANE

RILEY

ST

PL

LANE

UNION

HIGH

WOODRIFF

EDWARDS

LAWSON

SOPER

DBYD Address:
n/a Allen Place
Penrith NSW 2750

DBYD Job No: 12260526

DBYD Sequence No: 60829953

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SYDNEY WATER CORPORATION

Scale: 1:1500

Date of Production: 03/05/2017

Plan 1 of 1

N

0m 9m 18m 27m 36m

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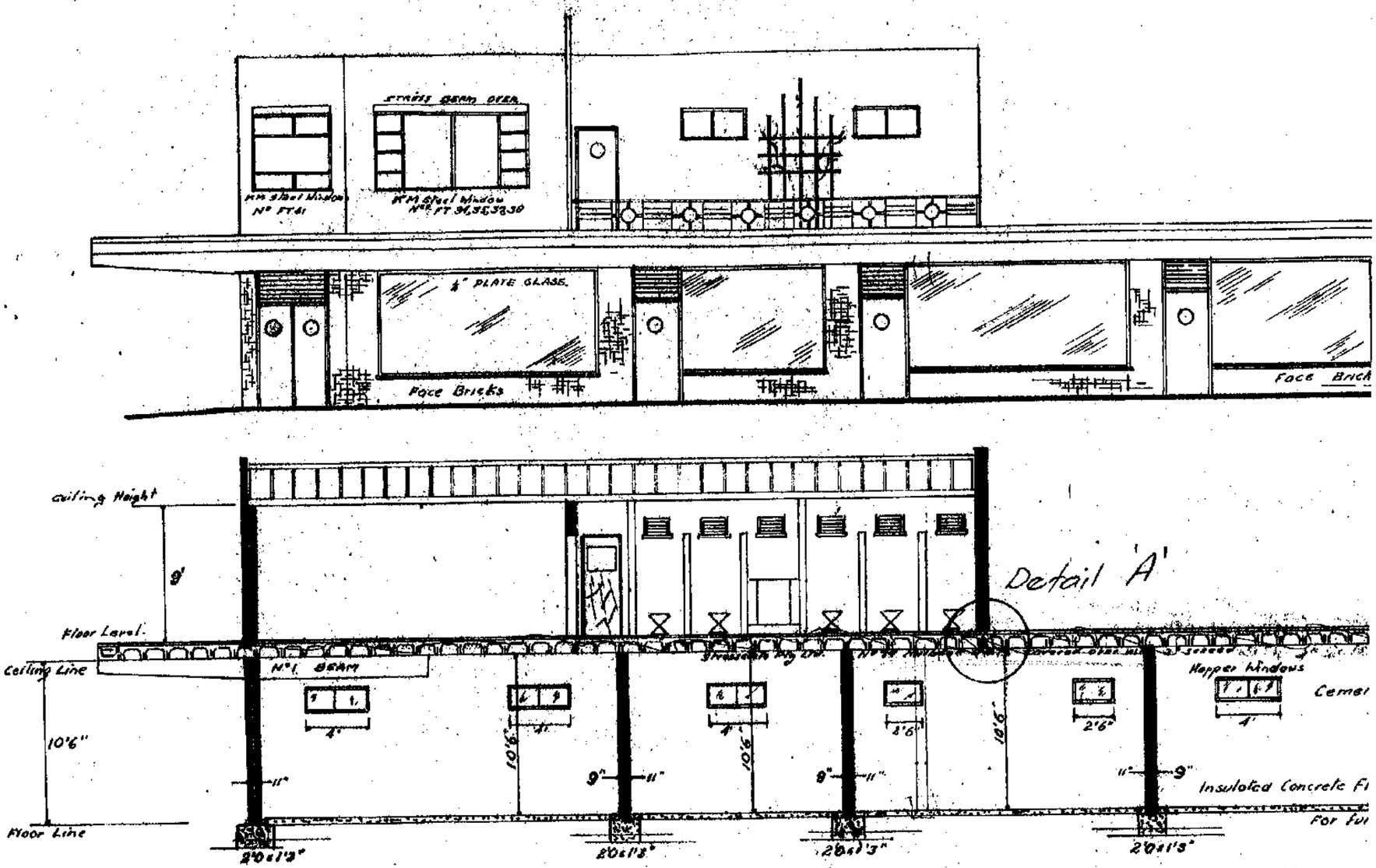
FRONT ELEVATION



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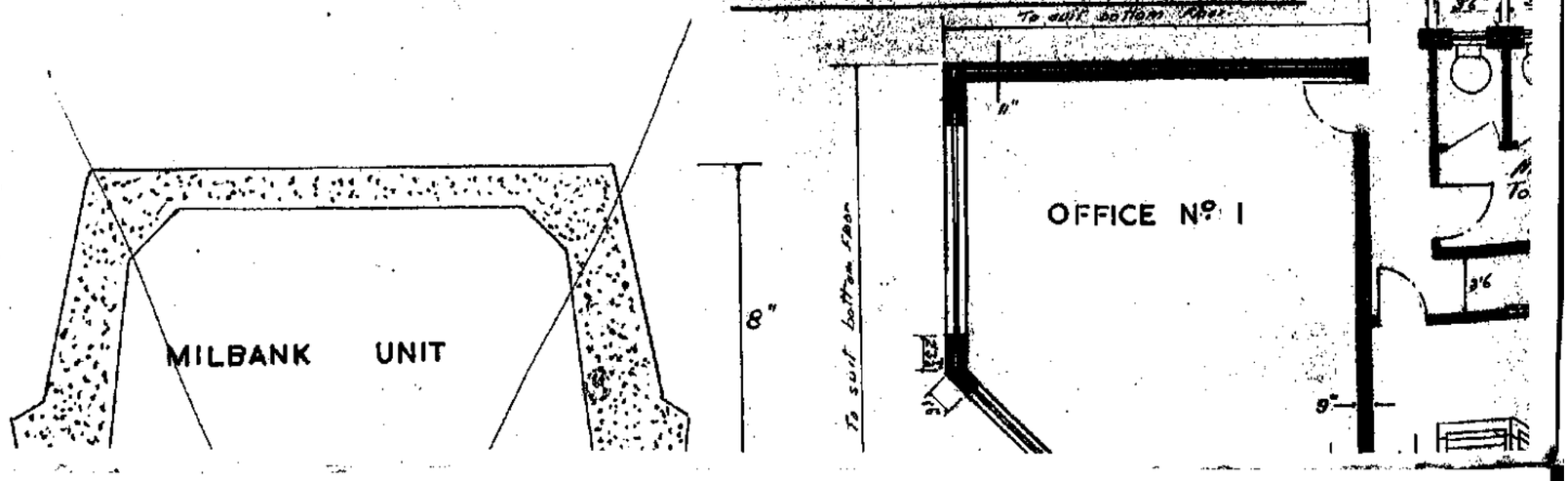

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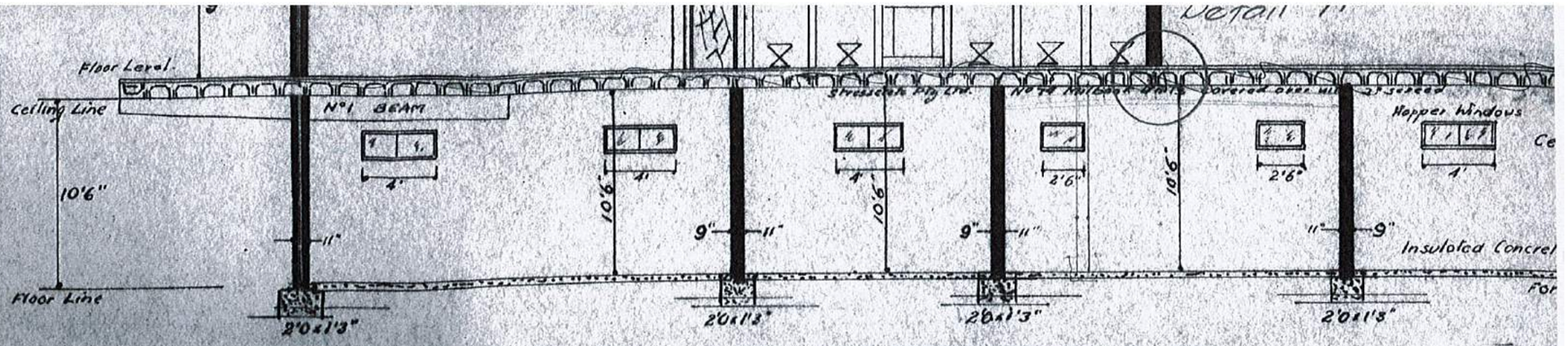
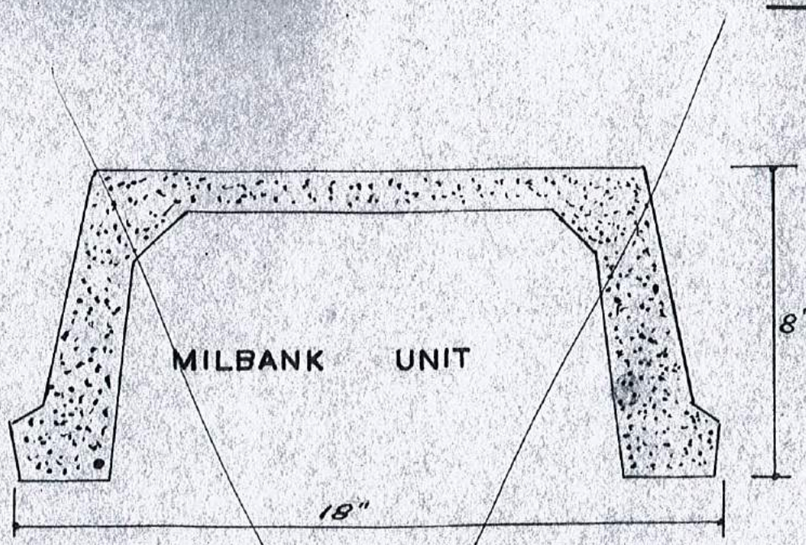
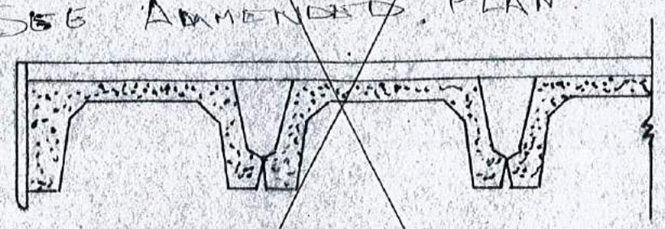


SECTIONAL ELEVATION

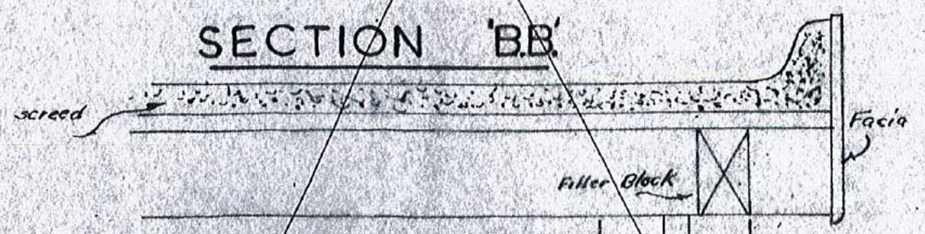


TYPICAL SECTION

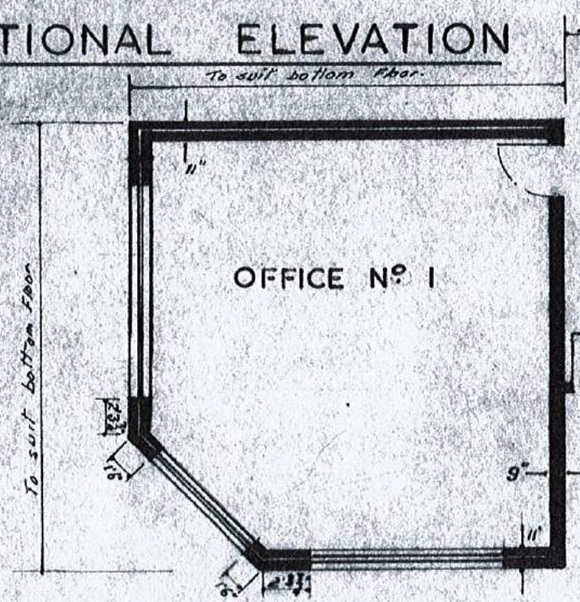
S56 AMENDED PLAN



SECTION 'B.B.'



SECTION 'A.A.'



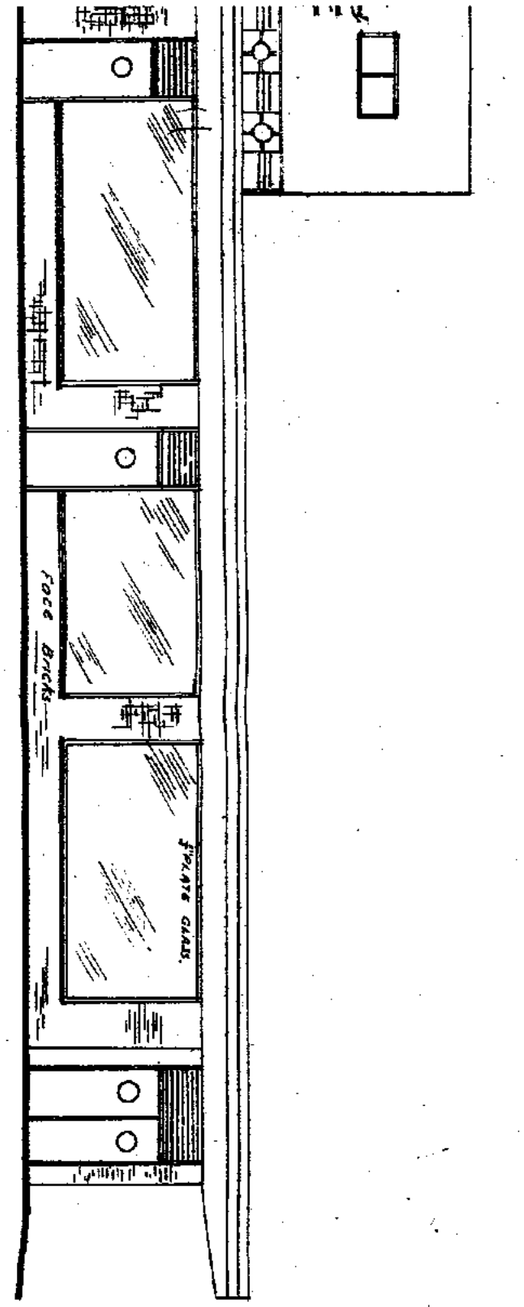
FLOOR PLAN OF OFFICE & TOILET BLOCK

REAR

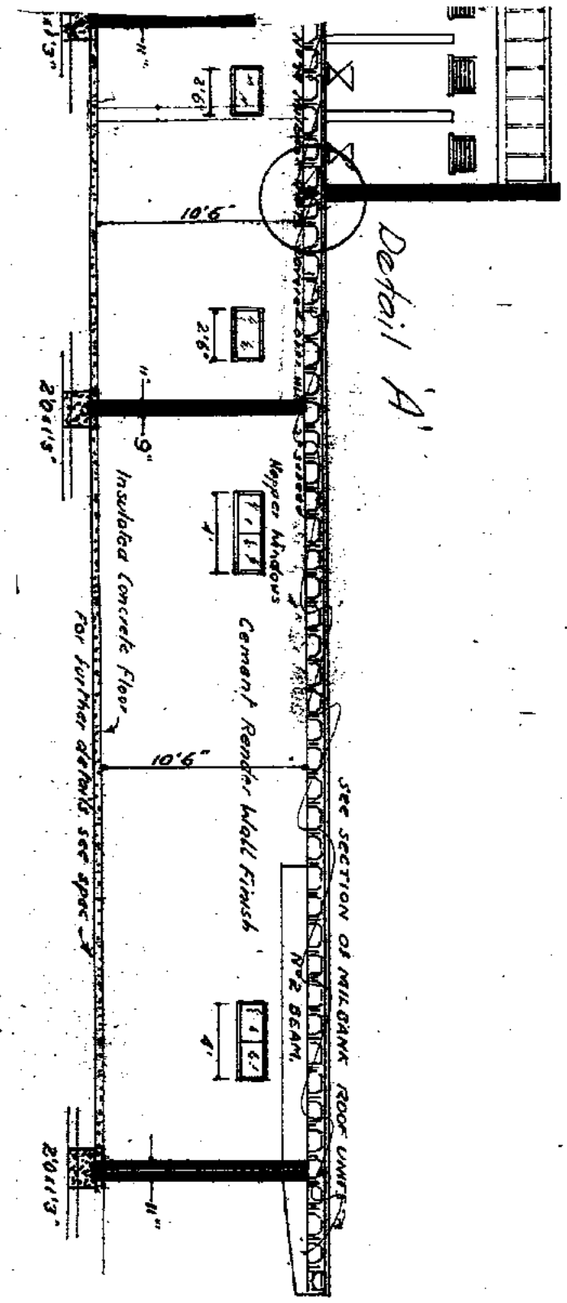
Document Set ID: 4855572
Version: 1, Version Date: 14/04/2021

Document Set ID: 9[illegible]379
Version: 1, Version Date: 14/04/2021

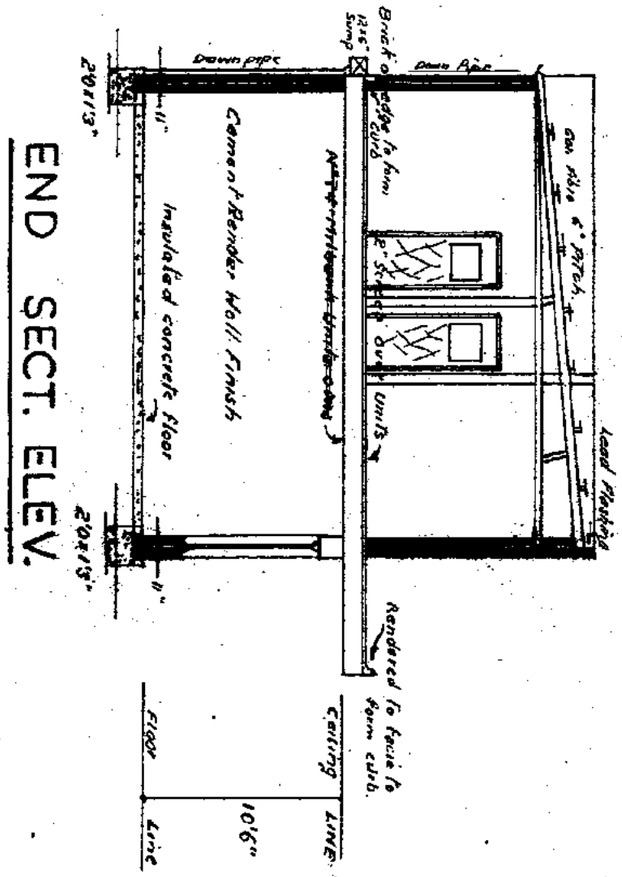
SIDE ELEVATION



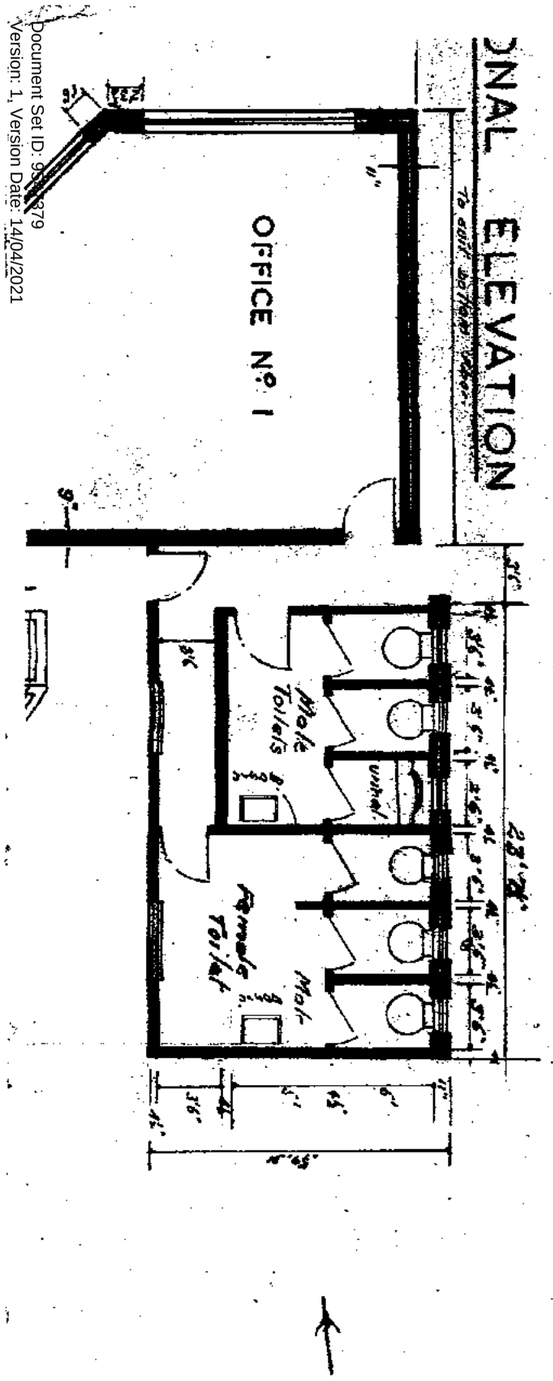
Detail 'A'



END SECT. ELEV.



ONAL ELEVATION

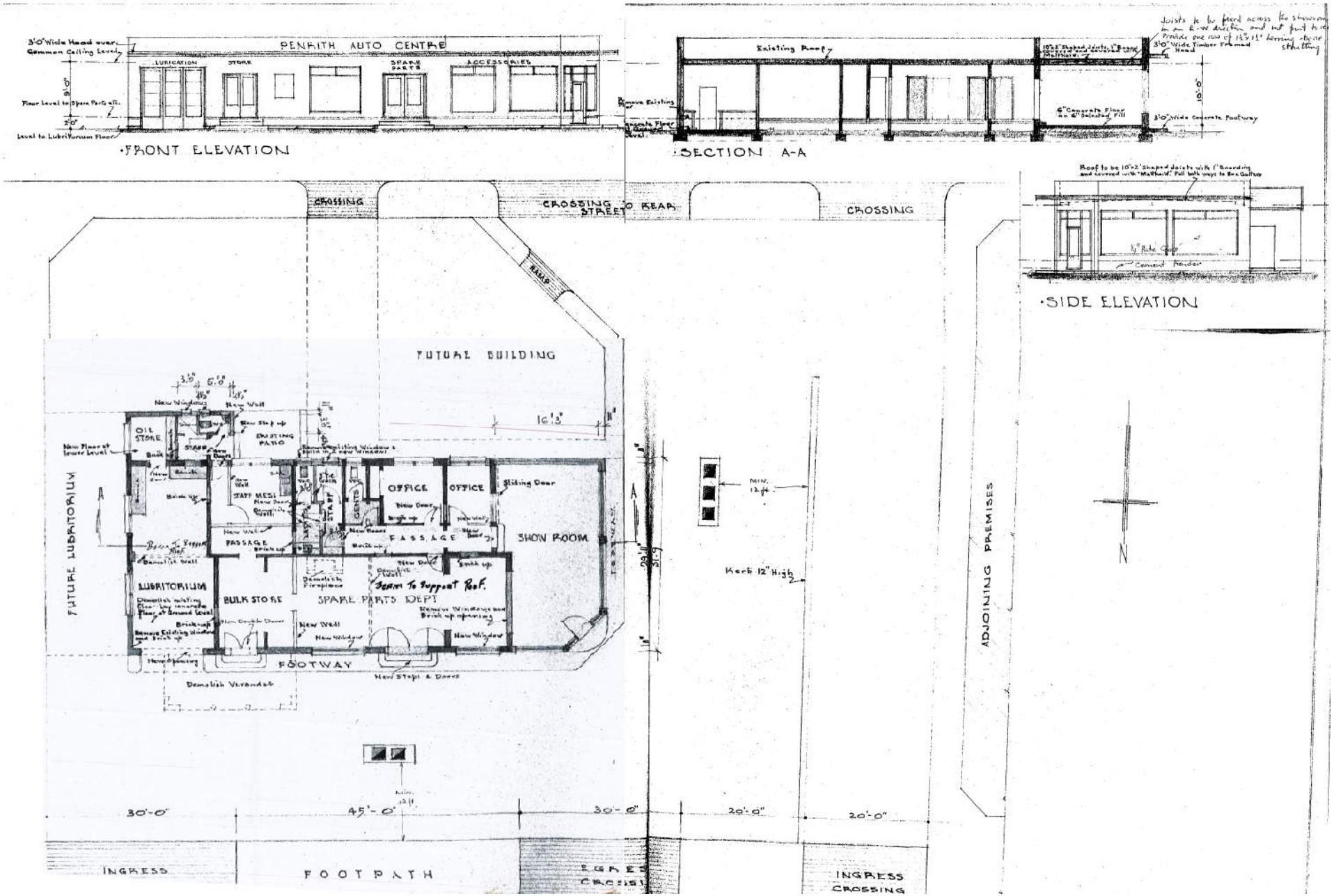


HENRY LANE

LOT No

SCALE $\frac{1}{8}\frac{4}{32}$" = 1 Foot

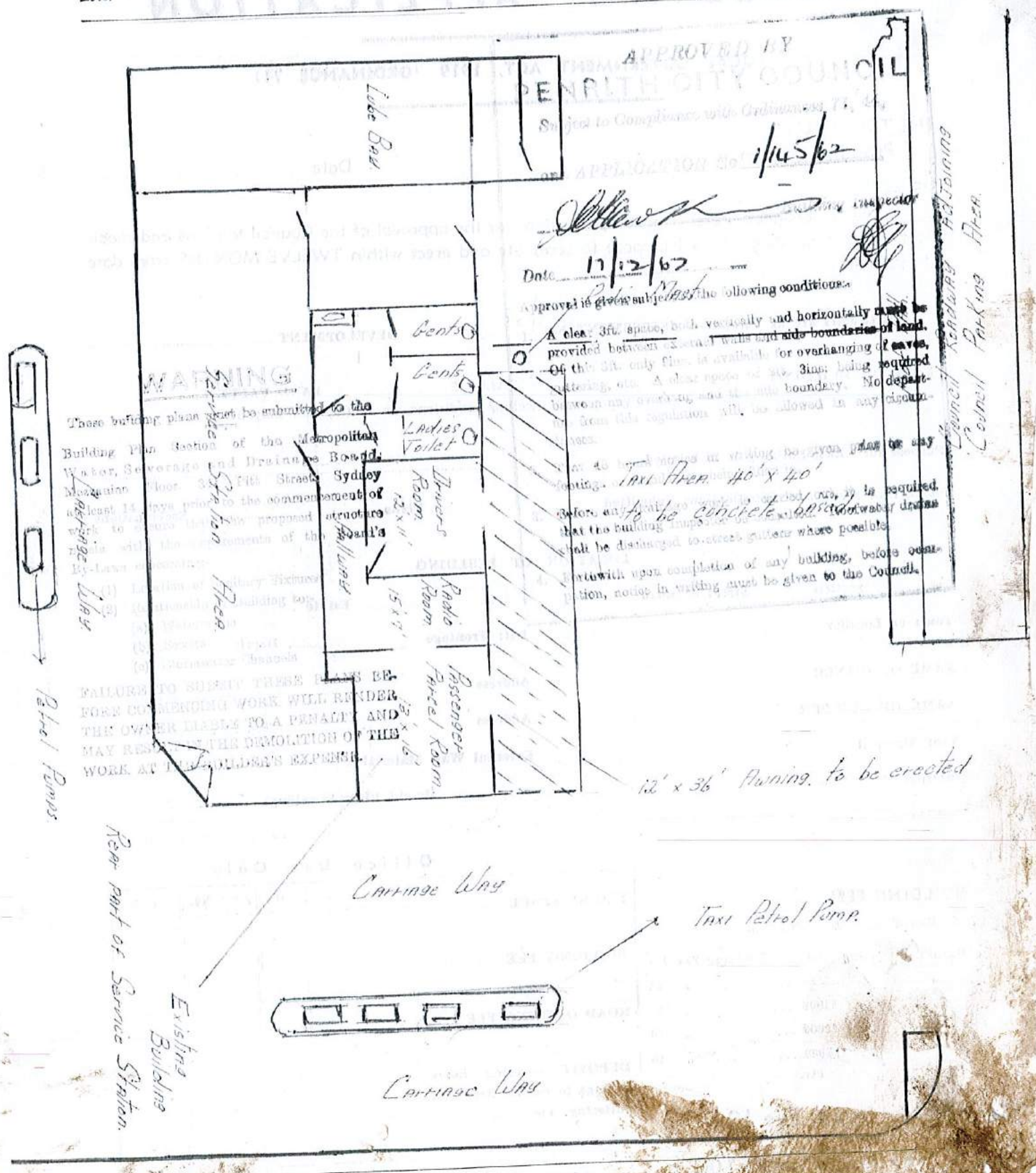
PLAN OF FOUR SHOPS *for* MR. G.H. UPTON
HENRY ST. PENRITH



Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Block Plan of Allotment and Plan of Proposed Building Thereon

Applicant must show hereunder a Block Plan on the Allotment, drawn to scale in ink, showing dimensions of allotment, the street to which it fronts, and position of proposed building thereon, including outhouses. The distances between buildings and boundaries of the allotment to be marked on plan. Also positions of any buildings on adjoining Lots.



I hereby agree to comply with all requirements and conditions written and printed herein.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix 2 – Reduced Architectural Plans

Document Set ID: 9241392
Version: 1, Version Date: 20/10/2021

SANDRAN
ATO - 121 HENRY STREET PENRITH
DEVELOPMENT APPLICATION
21-23776

LOCATION MAP

DRAWING LIST		
DRG NO.		
PROJECT No.	**SHEET**	**DRAWING TITLE**
1. ARCHITECTURAL		
21-23776	A001	COVER SHEET
21-23776	A100	SITE PLAN
21-23776	A102	UPPER AND LOWER BASEMENT
21-23776	A103	GROUND AND LEVEL 1
21-23776	A104	LEVEL 2 AND 3
21-23776	A107	LEVEL 8 AND 9 PLANT
21-23776	A108	ROOF PLAN
21-23776	A114	NORTH AND EAST ELEVATION
21-23776	A115	SOUTH AND WEST ELEVATION
21-23776	A116	NORTH AND WEST SECTION
21-23776	A117	STATION ST ARTIST IMPRESSION
21-23776	A118	HENRY ST ARTIST IMPRESSION
21-23776	L100	LANDSCAPE CONCEPT PLAN
21-23776	L101	LANDSCAPE SECTION

AREA SCHEDULE	
DESCRIPTION	**AREA**
UPPER BASEMENT EXISTING	4062.06 m²
LOWER BASEMENT EXISTING	2154.73 m²
SITE AREA	4482.58 m²
GROUND FLOOR EXISTING	1545.52 m²
LEVEL 1 EXISTING	1736.66 m²
LEVEL 1 PROPOSED WEST	118.07 m²
LEVEL 1 PROPOSED EAST	280.82 m²
LEVEL 2 EXISTING	1698.11 m²
LEVEL 3 EXISTING	1714.26 m²
LEVEL 4 EXISTING	1665.88 m²
LEVEL 5 EXISTING	1691.33 m²
LEVEL 6 EXISTING	1614.83 m²
LEVEL 7 EXISTING	1639.90 m²
LEVEL 8 EXISTING	1366.03 m²
LEVEL 9 EXISTING	1016.20 m²
Grand total	26786.98 m²

NOT FOR CONSTRUCTION

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
B	DEVELOPMENT APPLICATION		GL	PSC	ADM	01.10.14
A	DEVELOPMENT APPLICATION		GL			19.09.14

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DO NOT SCALE

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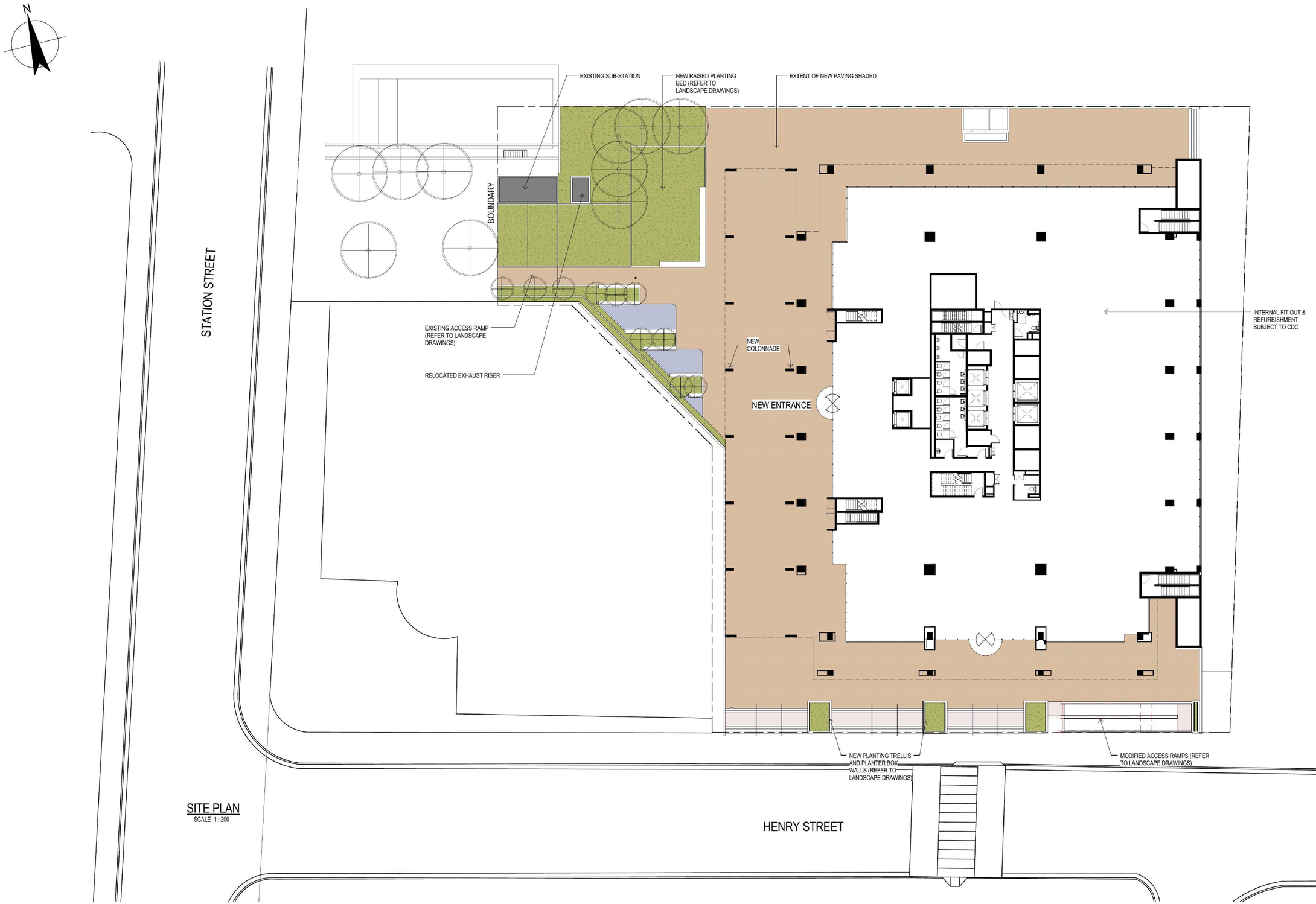
Drawn G. LYKOUREZOS | Designer A. IRONS
Drafting Check V. PRASAD* | Design Check P. ST CLAIR*
Approved (Project Director)
Date
Scale
This Drawing must not be used for Construction unless signed as Approved

Client **SANDRAN**
Project **ATO - 121 HENRY STREET PENRITH**
Title **DEVELOPMENT APPLICATION COVER SHEET**
Original Size **A1** Drawing No: **21-23776-A001** Rev: **B**

Plot Date: 7/10/2014 5:39:18 PM Cad File No: E:\Revit Files\21-23776-BUILDING_VV\Prasad.rvt

Document Set ID: 6841299
Version: 1, Version Date: 20/00/2024



SITE PLAN
SCALE 1 : 200

NOT FOR CONSTRUCTION

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
D	DEVELOPMENT APPLICATION		GL	PSC	ADM	07.10.14
C	DEVELOPMENT APPLICATION		GL	PSC	ADM	01.10.14
B	DEVELOPMENT APPLICATION		GL	PSC	ADM	19.09.14
A	PRELIMINARY ISSUE		GL	PSC	ADM	18.08.14

0 2000 4000 6000 8000 10000mm
SCALE 1:200 AT ORIGINAL SIZE

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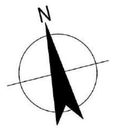
Drafting Check	V. PRASAD*	Design Check	P. ST CLAIR*
Approved (Project Director)			
Date			
Scale	1 : 200	This Drawing must not be used for Construction unless signed as Approved	

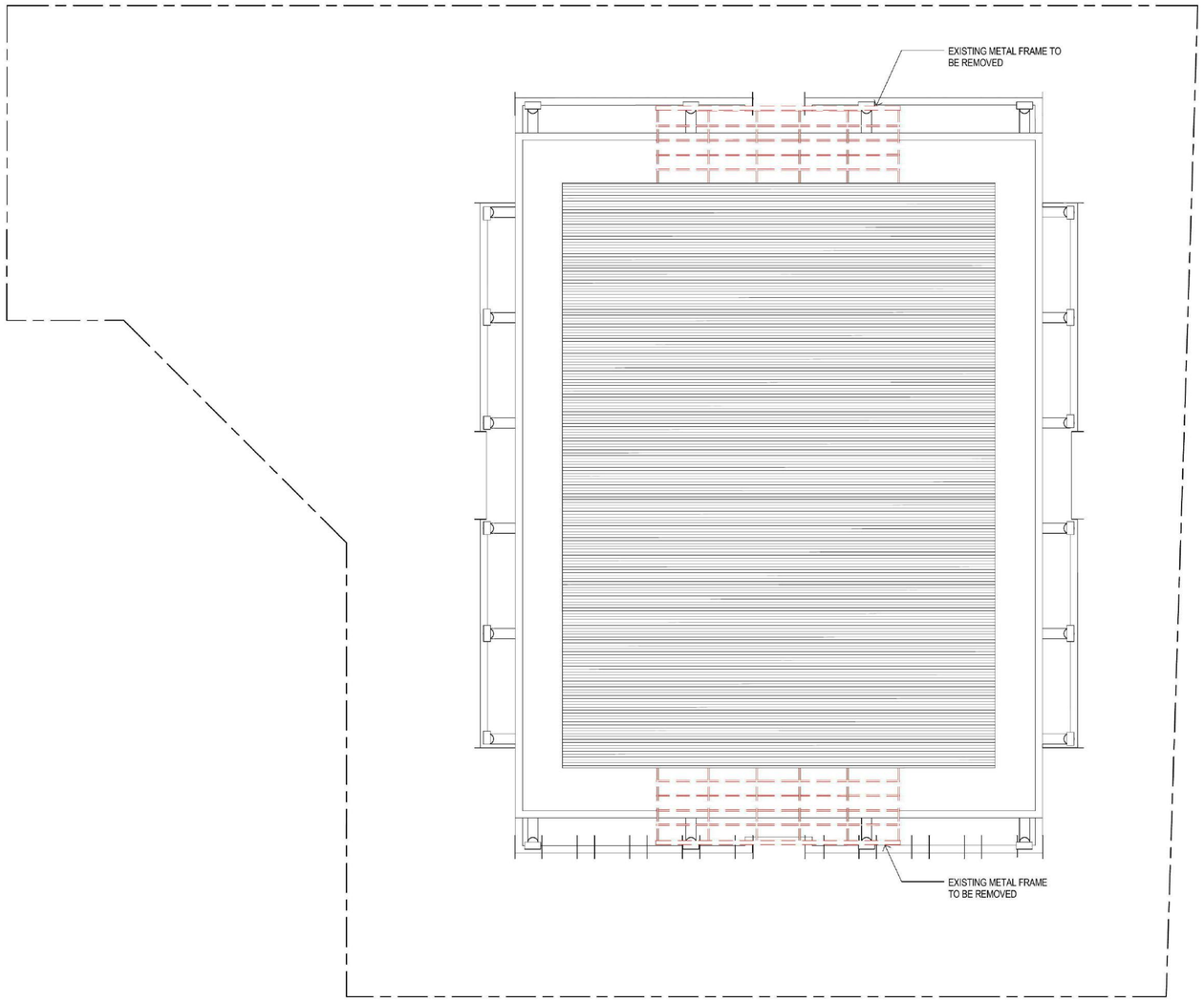
Client **SANDRAN**
Project **ATO - 121 HENRY STREET PENRITH**
Title **DEVELOPMENT APPLICATION**
SITE PLAN

Original Size **A1** Drawing No: **21-23776-A100** Rev: **C**

Plot Date: 7/10/2014 5:39:28 PM Cad File No: E:\Revit Files\21-23776-BUILDING_VVPrasad.rvt

Document Set ID: 6841299
Version: 1, Version Date: 20/08/2024





ROOF PLAN
SCALE 1 : 200

NOT FOR CONSTRUCTION

No	Revision Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
D	DEVELOPMENT APPLICATION	GL	PSC	ADM	07.10.14
C	DEVELOPMENT APPLICATION	GL	PSC	ADM	19.09.14
B	DEVELOPMENT APPLICATION	GL	PSC	ADM	05.09.14
A	PRELIMINARY ISSUE	GL	PSC	ADM	18.08.14

0 2000 4000 6000 8000 10000mm
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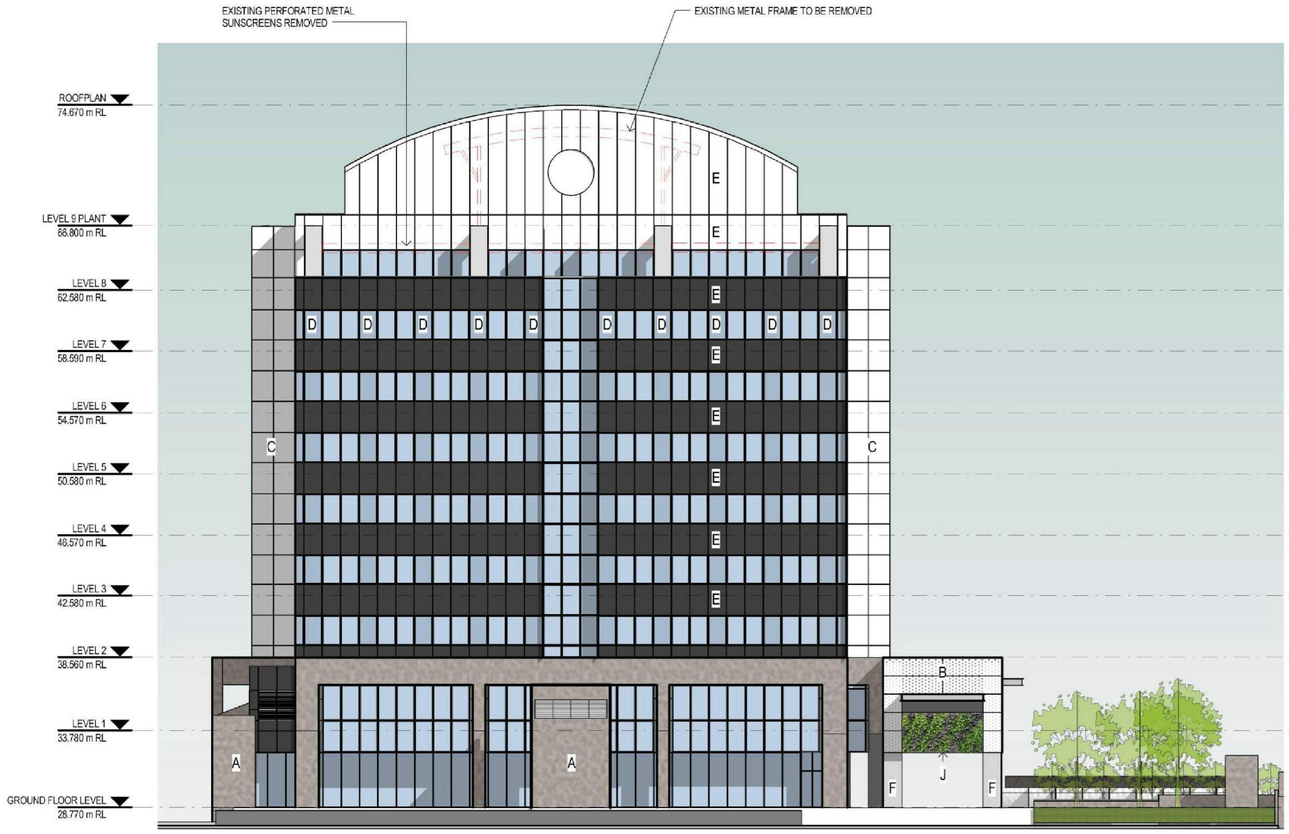
Drafting Check	V. PRASAD*	Design Check	P. ST CLAIR*
Approved (Project Director)			
Date			
Scale	1 : 200	This Drawing must not be used for Construction unless signed as Approved	

Client **SANDRAN**
Project **ATO - 121 HENRY STREET PENRITH**
Title **DEVELOPMENT APPLICATION**
ROOF PLAN

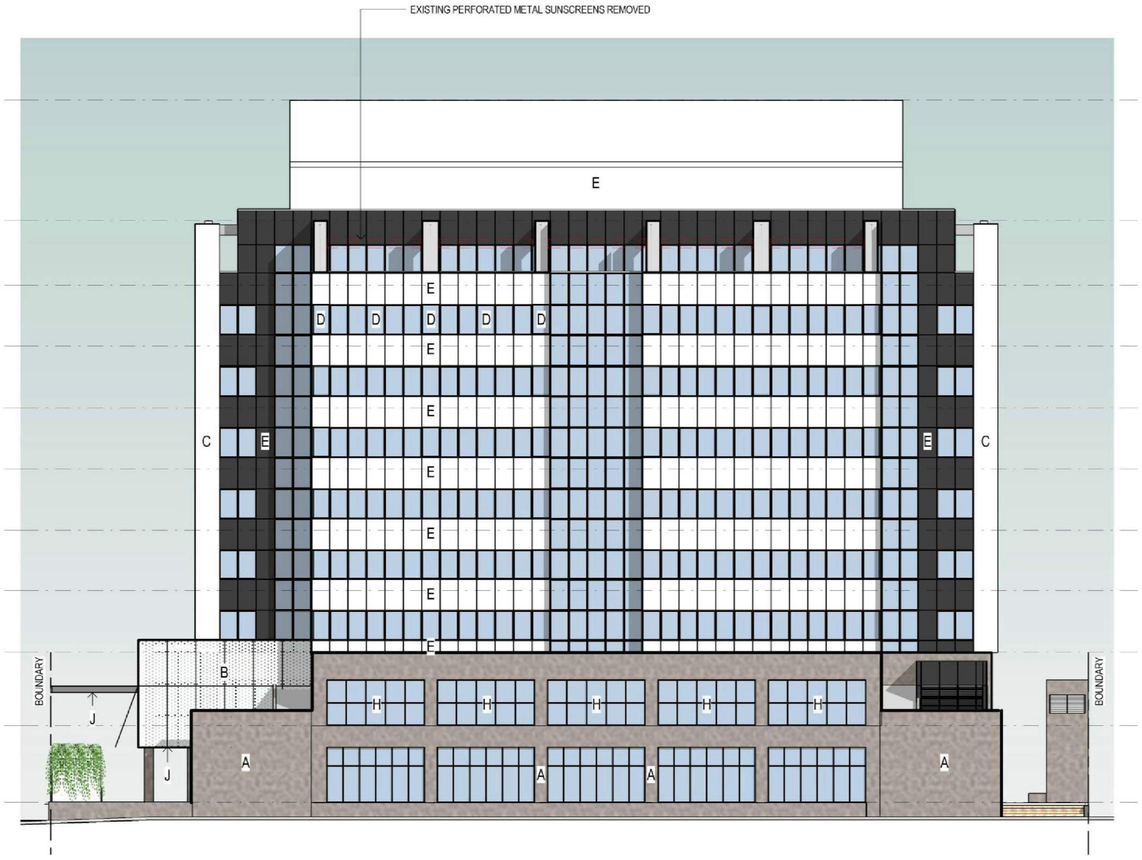
Original Size **A1** Drawing No: **21-23776-A108** Rev: **D**

Plot Date: 7/10/2014 5:40:23 PM Cad File No: E:\Revit Files\21-23776-BUILDING_VV\Prasad.rvt

Document Set ID: 8817399
Version: 1, Version Date: 20/08/2024



NORTH ELEVATION
SCALE 1 : 200



EAST ELEVATION
SCALE 1 : 200

FINISHES LEGEND:

A. EXISTING STONE CLADDING
B. NEW PERFORATED ALUMINIUM SCREENS
C. NEW ALUMINIUM PANEL TO MATCH EXISTING
D. REMOVE EXISTING ALUMINIUM PANEL & REPLACE WITH COLORBACK GLAZING
E. EXISTING ALUMINIUM PANEL WITH NEW PAINT FINISH
F. NEW OFF FORM CONCRETE WITH KEIM FINISH
H. NEW WINDOWS TO MATCH EXISTING
J. NEW INNOWOOD COMPOSITE TIMBER SOFFIT

NOT FOR CONSTRUCTION

No	Revision	Drawn	Job Manager	Project Director	Date
D	DEVELOPMENT APPLICATION	GL	PSC	ADM	07.10.14
C	DEVELOPMENT APPLICATION	GL	PSC	ADM	01.10.14
B	DEVELOPMENT APPLICATION	GL	PSC	ADM	19.09.14
A	DEVELOPMENT APPLICATION	GL	PSC	ADM	05.09.14

Note: * indicates signatures on original issue of drawing or last revision of drawing

0 2000 4000 6000 8000 10000mm
SCALE 1:200 AT ORIGINAL SIZE

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Drafting Check V. PRASAD* | Design Check P. ST CLAIR*
Approved (Project Director)
Date
Scale As indicated
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Client SANDRAN
Project ATO - 121 HENRY STREET PENRITH
Title DEVELOPMENT APPLICATION NORTH AND EAST ELEVATION

Original Size A1
Drawing No: 21-23776-A114
Rev: D

Plot Date: 7/10/2014 1:27:57 PM
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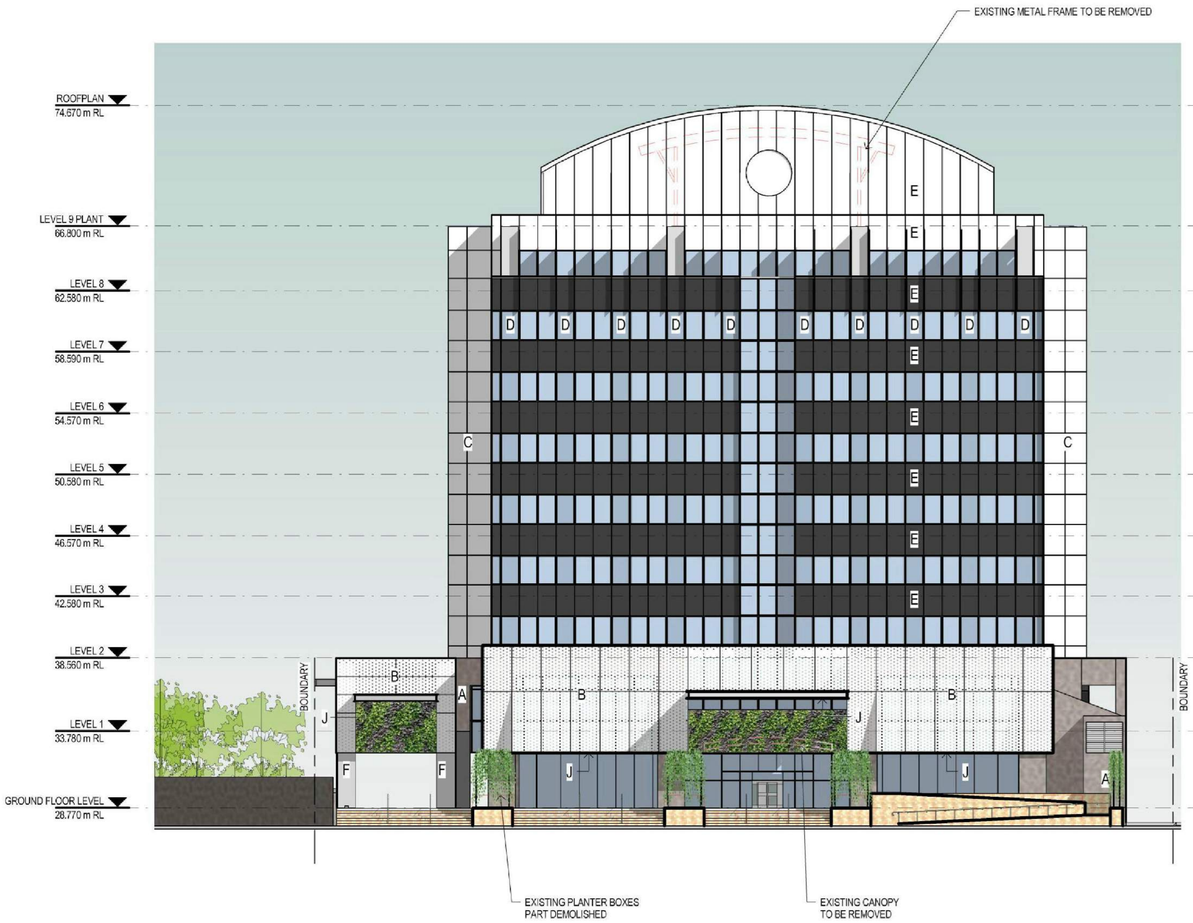
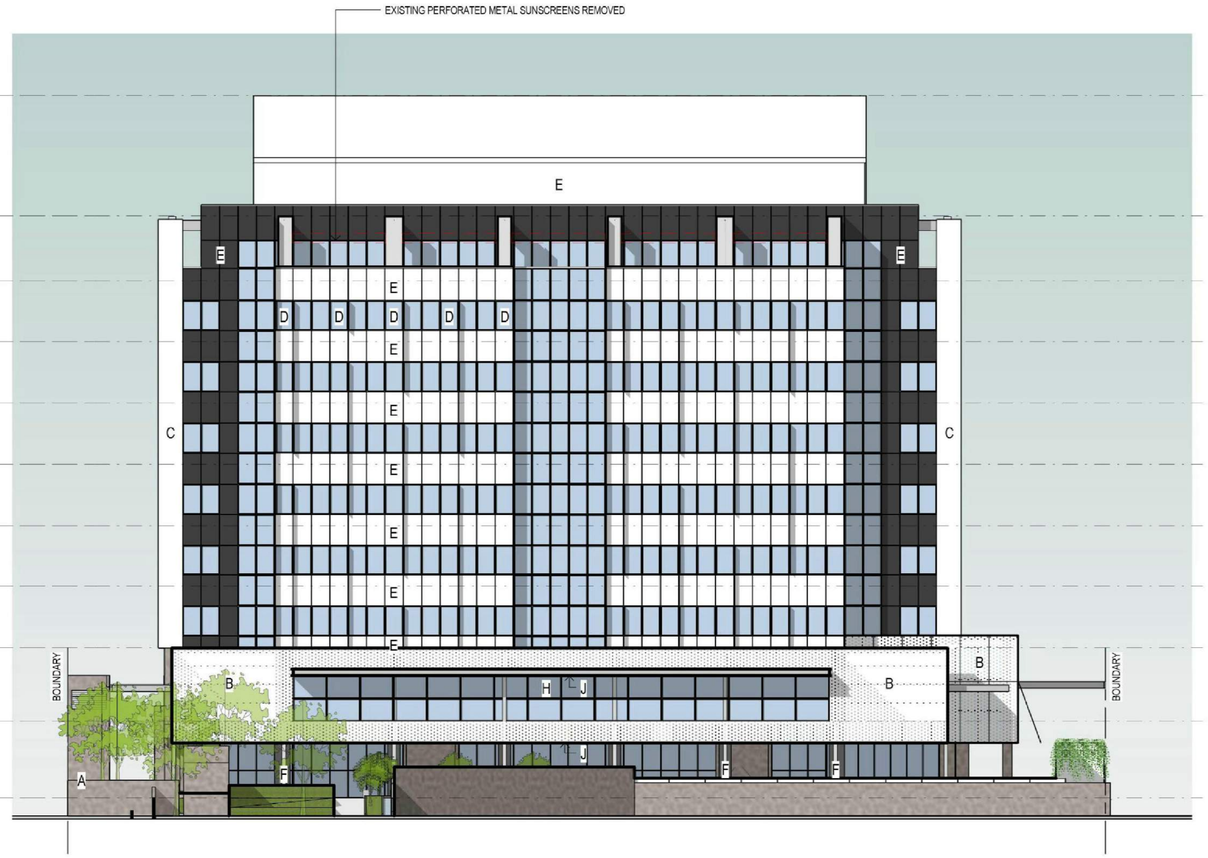
Document Set ID: 6841299
Version: 1, Version Date: 20/00/2024



SOUTH ELEVATION

SCALE 1 : 200



WEST ELEVATION

SCALE 1 : 200

FINISHES LEGEND:

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B. NEW PERFORATED ALUMINIUM SCREENS
C. NEW ALUMINIUM PANEL TO MATCH EXISTING
D. REMOVE EXISTING ALUMINIUM PANEL & REPLACE WITH COLORBACK GLAZING
E. EXISTING ALUMINIUM PANEL WITH NEW PAINT FINISH
F. NEW OFF FORM CONCRETE WITH KEIM FINISH
H. NEW WINDOWS TO MATCH EXISTING
J. NEW INNOWOOD COMPOSITE TIMBER SOFFIT

NOT FOR CONSTRUCTION

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
D	DEVELOPMENT APPLICATION		GL	PSC	ADM	07.10.14
C	DEVELOPMENT APPLICATION		GL	PSC	ADM	01.10.14
B	DEVELOPMENT APPLICATION		GL	PSC	ADM	19.09.14
A	DEVELOPMENT APPLICATION		GL	PSC	ADM	05.09.14

0 2000 4000 6000 8000 10000mm
SCALE 1:200 AT ORIGINAL SIZE

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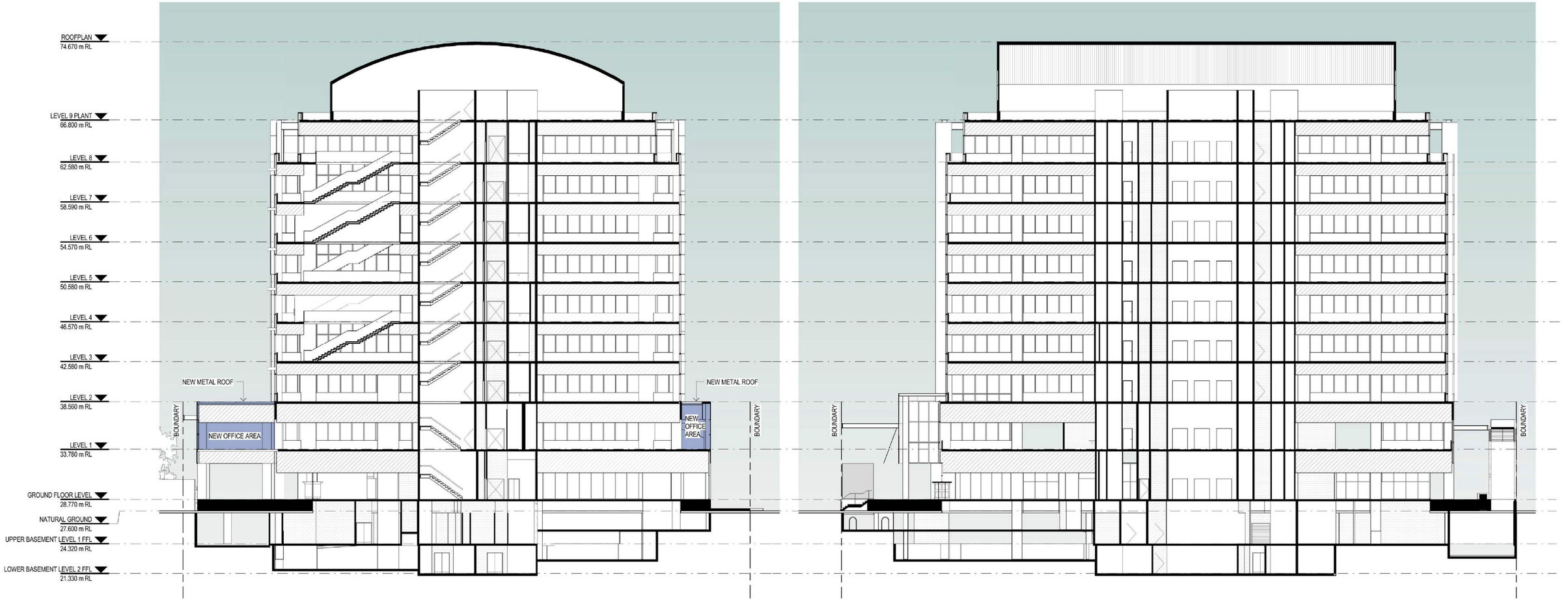
Approved (Project Director)			
Date			
Scale	As indicated	This Drawing must not be used for Construction unless signed as Approved	

Client **SANDRAN**
Project **ATO - 121 HENRY STREET PENRITH**
Title **DEVELOPMENT APPLICATION**
SOUTH AND WEST ELEVATION

Original Size **A1** Drawing No: **21-23776-A115** Rev: **D**

Plot Date: 7/10/2014 1:34:44 PM Cad File No: C:\Users\bmstacruz\Documents\21-23776-BUILDING_bmstacruz.rvt

Document Set ID: 8581299
Version: 1, Version Date: 20/08/2024



NORTH SECTION
SCALE 1 : 200

WEST SECTION
SCALE 1 : 200

NOT FOR CONSTRUCTION

No	Revision	Drawn	Job Manager	Project Director	Date
D	DEVELOPMENT APPLICATION	GL	PSC	ADM	07.10.14
C	DEVELOPMENT APPLICATION	GL	PSC	ADM	01.10.14
B	DEVELOPMENT APPLICATION	GL	PSC	ADM	19.09.14
A	DEVELOPMENT APPLICATION	GL	PSC	ADM	05.09.14

Note: * indicates signatures on original issue of drawing or last revision of drawing

0 2000 4000 6000 8000 10000mm
SCALE 1:200 AT ORIGINAL SIZE

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Drafting Check	V. PRASAD*	Design Check	P. ST CLAIR*
Approved (Project Director)			
Date			
Scale	1 : 200	This Drawing must not be used for Construction unless signed as Approved	

Client SANDRAN
Project ATO - 121 HENRY STREET PENRITH
Title DEVELOPMENT APPLICATION
NORTH AND WEST SECTION

Original Size A1
Drawing No: 21-23776-A116
Rev: D

Plot Date: 7/10/2014 5:40:58 PM
Cad File No: E:\Revit Files\21-23776-BUILDING_VVPrasad.rvt

Document Set ID: 6817399
Version: 1, Version Date: 20/00/2024

NOT FOR CONSTRUCTION

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
A	DEVELOPMENT APPLICATION		MRY	PSC	ADM	07.10.14

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Drafting Check	V. PRASAD*	Design Check	P. ST CLAIR*
Approved (Project Director)			
Date			
Scale	This Drawing must not be used for Construction unless signed as Approved		

Client **SANDRAN**
Project **ATO - 121 HENRY STREET PENRITH**
Title **DEVELOPMENT APPLICATION**
STATION ST ARTIST IMPRESSION

Original Size **A1** Drawing No: **21-23776-A117** Rev: **A**

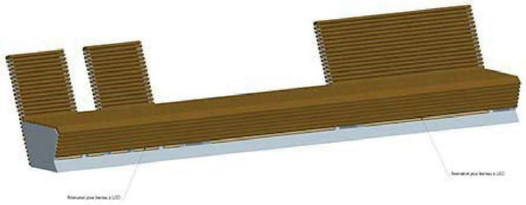
Plot Date: 7/10/2014 5:41:20 PM Cad File No: E:\Revit Files\21-23776-BUILDING_VVPrasad.rvt

Document Set ID: 6817399
Version: 1, Version Date: 20/00/2024

Appendix 3 – Reduced Landscape Plan

Document Set ID: 9241392
Version: 1, Version Date: 20/10/2021

SEATING



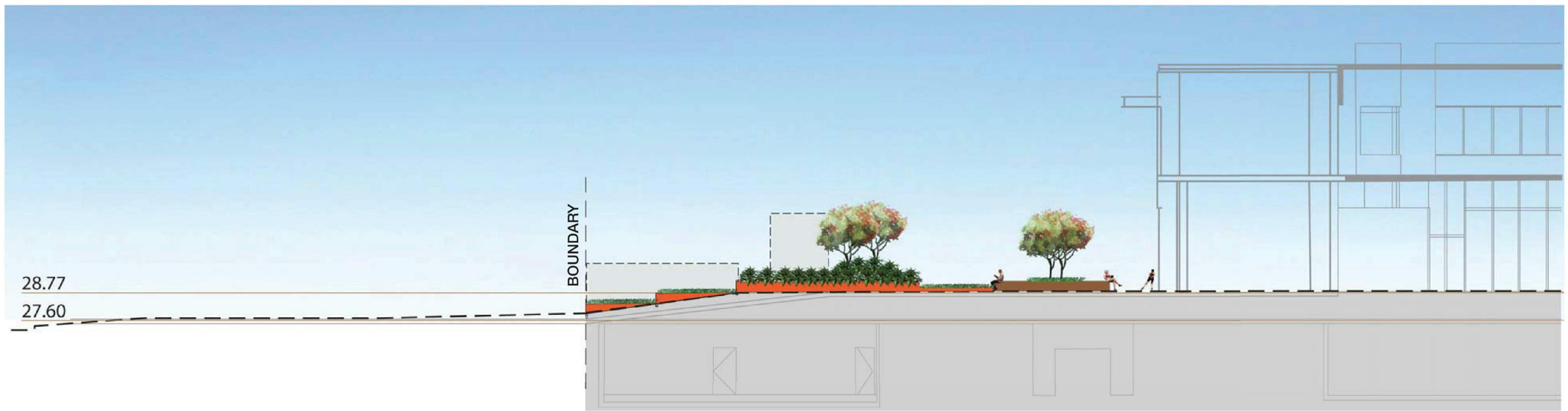
PLANTING

GREEN WALL

PICNIC AREAS

PAVING

CANOPY



NOT FOR CONSTRUCTION

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
A	DEVELOPMENT APPLICATION		CD	PS	AD	1.10.14

0 2000 4000 6000 8000 10000mm
SCALE 1:200 AT ORIGINAL SIZE

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Drafting Check	V.PRASAD*	Design Check	P. ST CLAIR*
Approved (Project Director)			
Date			
Scale	1:200	This Drawing must not be used for Construction unless signed as Approved	

Client SANDRAN
Project ATO - 121 HENRY STREET PENRITH
Title DEVELOPMENT APPLICATION
LANDSCAPE SECTION

Original Size A1
Drawing No: 21-23776-L101
Rev: A

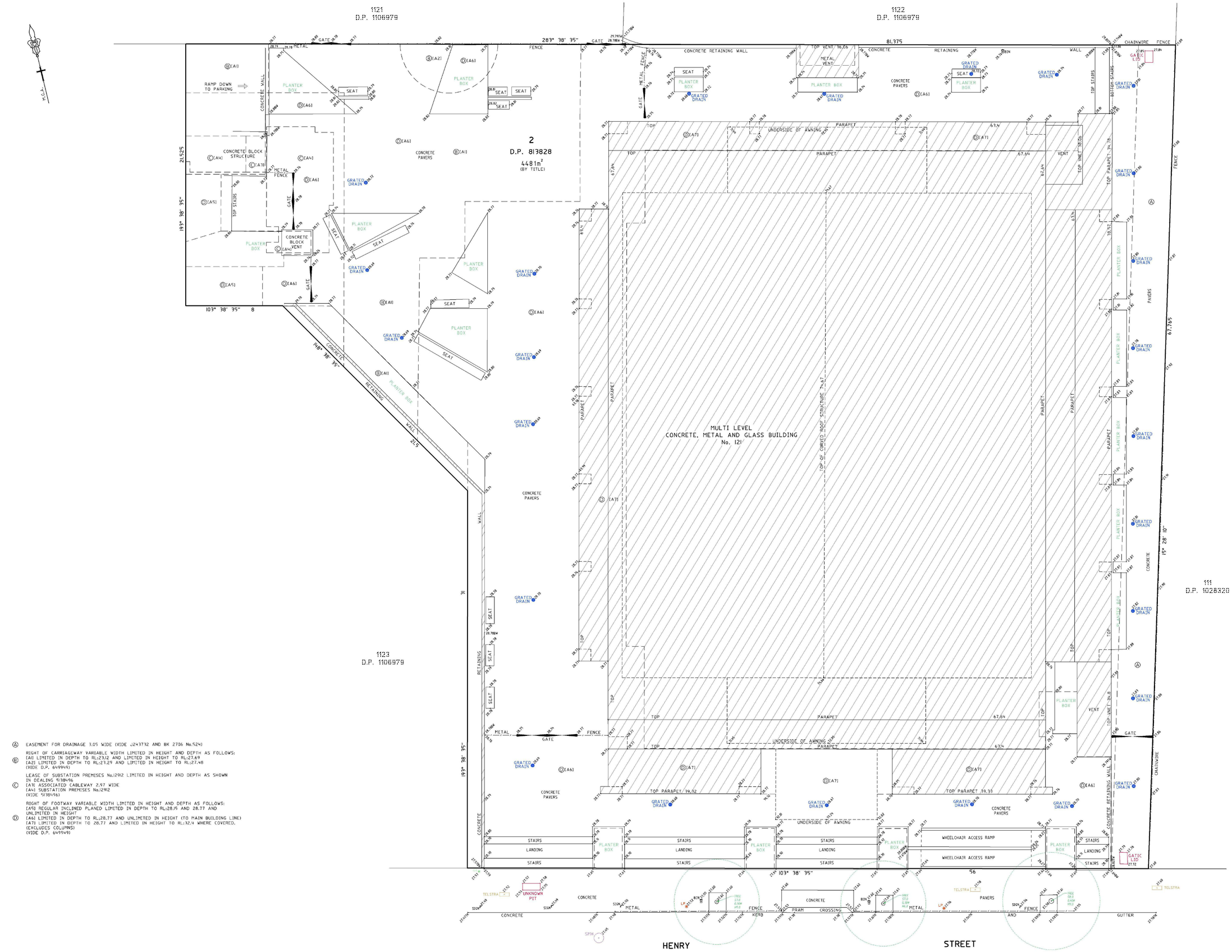
Plot Date: 1 October 2014 - 11:17 AM Plotted by: Caitriona O'Dowd Cad File No: G:\21\23776\CADD\Landscape\21-23776-L001.dwg

Document Set ID: 8841299
Version: 1, Version Date: 20/00/2024

Appendix 1 – Reduced Survey Plan

Document Set ID: 9241392
Version: 1, Version Date: 20/10/2021

A0



(A) EASEMENT FOR DRAINAGE 3.05 WIDE (VIDE J243732 AND BK 2706 No.524)

(B) RIGHT OF CARRIAGEWAY VARIABLE WIDTH LIMITED IN HEIGHT AND DEPTH AS FOLLOWS:
[A1] LIMITED IN DEPTH TO RL:23.32 AND LIMITED IN HEIGHT TO RL:27.69
[A2] LIMITED IN DEPTH TO RL:23.29 AND LIMITED IN HEIGHT TO RL:27.48
(VIDE D.P. 649949)

LEASE OF SUBSTATION PREMISES No.J2912 LIMITED IN HEIGHT AND DEPTH AS SHOWN IN DEALING 5380496
(C) [A3] ASSOCIATED CABLEWAY 2.97 WIDE
[A4] SUBSTATION PREMISES No.J2912
(VIDE 5380496)

RIGHT OF FOOTWAY VARIABLE WIDTH LIMITED IN HEIGHT AND DEPTH AS FOLLOWS:
(D) [A5] REGULAR INCLINED PLANED LIMITED IN DEPTH TO RL:28.15 AND 28.77 AND UNLIMITED IN HEIGHT
[A6] LIMITED IN DEPTH TO RL:28.77 AND UNLIMITED IN HEIGHT (TO MAIN BUILDING LINE)
[A7] LIMITED IN DEPTH TO 28.77 AND LIMITED IN HEIGHT TO RL:92.4 WHERE COVERED.
(EXCLUDES COLUMNS)
(VIDE D.P. 649949)

0m 2.5 5.0 7.5 10m

SCALE 1:100

NOTES

- TREE SIZES ARE ESTIMATES ONLY
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JEMENA GAS	Ph. 132909
ENERGY AUSTRALIA	Ph. 131525
INTEGRAL ENERGY	Ph. 131002
SYDNEY WATER	Ph. 132092
OPTUS-VISION	Ph. 1800 505777

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HORIZONTAL DATUM:
CO-ORDINATE SYSTEM: ASSUMED

MARKS ADOPTED:
MGA ORIENTATION

VERTICAL DATUM:
DATUM: A.H.D.
B.M. ADOPTED: PM12654
R.L. 28.65
SOURCE: S.C.I.M.S.

REV.	AMENDMENTS	DATE
A	FINAL ISSUE	13-08-2014

CLIENT:
GHD
LEVEL 15
133 CASTLEREAGH STREET
SYDNEY NSW 2000

PLAN
SHOWING DETAIL AND LEVELS OVER ATO BUILDING,
121 HENRY STREET, PENRITH

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L.G.A. PENRITH		SHEET 1 OF 1	
SURVEYED DE	DRAWN GS	CHECKED DE	APPROVED
SURVEY REFERENCE 33913		SCALE 1:100	DATE 13-08-2014
DRAWING NUMBER 33913A02.DWG			REV. A

Document Set ID: 6937299
Version: 1, Version Date: 28/08/2024

Appendix F Sub-Slab Vapour Probe and Groundwater Monitoring Well Installation Logs

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBMW01

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: Henry Street

Date: 10:04:18 AM
Logged By: CB
Contractor: Terratest
Total Hole Depth (mbgs): 12
Bore Diameter (mm): 125

Eastings (GDA 94): 286582.1
Northings (GDA 94): 6262950
Zone/Area/Permit#:
Reference Level: AHD
Elevation (m): 27.635

Water Level Initial (mbgs): 6.8
Surface Finish: Gatic
Casing / Screen Type: Class 18 PVC - 50mm
Casing Bottom Depth (mbgs): 9
Screen Bottom Depth (mbgs): 12

Method	Water (mbgs)	Well Details	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
PT						Fill	PEBBLES (driveway)		
				0.10		Fill	Sandy CLAY- Brown, soft, homogenous, dry. Minor gravel inclusions	JBMW01 1-1.2 PID = 5.5 ppm	No odours, staining or asbestos
				1.20		Fill	SAND - Brown. Medium grained, angular, homogenous, loose, dry		FILL to NATURAL
				1.30		CL-SC	Sandy CLAY - Grey/red. Soft, low plasticity, damp, soft and mottled		
			2					JBMW01 2-2.2 PID = 9 ppm	No odours, staining or asbestos
				2.50		CL	CLAY - Red/brown. Dry-damp, low-medium plasticity, homogenous. Inclusions of black clasts	JBMW01 3-3.2 PID = 8 ppm	Possible decaying natural organic material
			4	3.80		CL-SC	Sandy CLAY - Red/Grey, dry-damp, low plasticity, homogenous and soft	JBMW01 4-4.2 PID = 9.2 ppm	No odours, staining or asbestos
				4.40		CL-SC	Sandy CLAY - Orange/grey, medium dense, homogenous and soft	JBMW01 5-5.2 PID = 10.6 ppm	No odours, staining or asbestos
				5.50		CL-SC	Sandy CLAY - Orange/grey/brown, dry-damp, low-medum plasticity and homogenous. Mottled with inclusions of black clasts/		
			6					JBMW01 6-6.2 PID = 9.6 ppm	Possible decaying natural organic material
				6.20		CL-SC	Sandy CLAY - Grey, damp, homogenous, loose - medium dense		
				6.50		GS	Sandy GRAVEL - Well graded, medium sand - boulders. Rounded, loose, saturated and homogenous		
SFA								JBMW01 7-7.2 PID = 9.2 ppm	No odours, staining or asbestos
			8						
			10						Borehole collapse, well installed to 10.5 m
			12						
				12.00			Borehole JBMW01 terminated at 12m		

WELL_JBSG WELL - 2017.GPJ GINT STD AUSTRALIA.GDT 8/5/18

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBMW02

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: Henry Street

Date: 10:04:18 AM
Logged By: CB
Contractor: Terratest
Total Hole Depth (mbgs): 11.5
Bore Diameter (mm): 125

Eastings (GDA 94): 286636
Northings (GDA 94): 6262944.7
Zone/Area/Permit#:
Reference Level: AHD
Elevation (m): 27.54

Water Level Initial (mbgs): 7.3
Surface Finish: Gatic
Casing / Screen Type: Class 18 PVC - 50mm
Casing Bottom Depth (mbgs): 7.5
Screen Bottom Depth (mbgs): 10.5

Method	Water (mbgs)	Well Details	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples / Tests / Remarks	Additional Observations
PMT				0.05		Fill	ASHPHALT		
						Fill	ASHPHALT and CONCRETE		
				0.30		CL-SC	Sandy CLAY - Light brown/orange, stiff	JBMW02 0.4-0.5 PID = 7.8 ppm	FILL to NATURAL No odours, staining or asbestos
				0.40		CL	CLAY - Dark brown/grey. damp, firm, medium - high plasticity. Inclusions; gravels, sand	JBMW02 0.8-1 PID = 7.5 ppm	No odours, staining or asbestos
								JBMW02 1.4-1.5 PID = 7 ppm	No odours, staining or asbestos
			2	1.70		CL	CLAY - Grey, brown/red. Firm-stiff, moist-damp, homogenous	JBMW02 2-2.2 PID = 5.1 ppm	No odours, staining or asbestos
				2.50		CL	CLAY - Grey, brown/red. Firm-stiff, moist-damp, homogenous. Inclusions of fine angular gravels	JBMW02 2.5-2.7 PID = 5 ppm	No odours, staining or asbestos. Inclusions of fine angular gravels.
								JBMW02 3-3.2 PID = 6.8 ppm	No odours, staining or asbestos
			4	4.00		CL	CLAY - Grey, red. Firm-stiff, moist-damp high plasticity. Inclusions of fine angular gravels	JBMW02 4-4.2 PID = 7.2 ppm	No odours, staining or asbestos
				4.60		CL	CLAY - Grey. Damp, stiff, high plasticity homogenous. Inclusions of fine black clasts	JBMW02 5-5.2 PID = 9 ppm	No odours, staining or asbestos. Inclusions of fine black clasts.
				5.50		CL-SC	Sandy CLAY - Yellow/orange. Soft, heterogenous, damp and mottled		
			6					JBMW02 6-6.2 PID = 12.8 ppm	No odours, staining or asbestos
				6.20		CL	CLAY - Grey. Damp, firm, high plasticity homogenous.		
				6.30		CL-SC	Sandy CLAY - Orange/brown. Soft, heterogenous		
	▼							JBMW02 7-7.2 PID = 14.3 ppm	No odours, staining or asbestos
	▼			7.30		CL	CLAY - Grey, high plasticity and stiff. Minor gravel inclusions		
				7.50		CL-GS	Gravelly Sandy CLAY - Orange/grey. Soft, moist. Minor gravel inclusions		
			8	8.00		CH-GS	Gravelly Sandy CLAY - Orange/grey. Soft, moist. River gravel inclusions	JBMW02 8-8.2 PID = 8.3 ppm	No odours, staining or asbestos. River gravels present.
SFA									
			10						
				11.50			Borehole JBMW02 terminated at 11.5m		
			12						

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBMW03

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: Henry Street

Date: 10:04:18 AM
Logged By: CB
Contractor: Terratest
Total Hole Depth (mbgs): 12.1
Bore Diameter (mm): 125

Eastings (GDA 94): 286658.1
Northings (GDA 94): 6262932.3
Zone/Area/Permit#:
Reference Level: AHD
Elevation (m): 27.845

Water Level Initial (mbgs): 7
Surface Finish: Gatic
Casing / Screen Type: Class 18 PVC - 50mm
Casing Bottom Depth (mbgs): 9
Screen Bottom Depth (mbgs): 12

Method	Water (mbgs)	Well Details	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
PT						Fill	CONCRETE		
				0.15		SP	Clayey, gravelly SAND - Yellow/brown. Loose, dry, medium grained, angular. Inclusions of sandstone	JBMW03 0.2-0.3 PID = 5.3 ppm	FILL to NATURAL No odours, staining or asbestos
				0.40		CL-SC	Sandy CLAY- Brown/orange, firm, medium-high plasticity, dry-damp. Inclusions of fine-medium sand and angular gravels		
								JBMW03 1-1.2 PID = 14.1 ppm	No odours, staining or asbestos
			2					JBMW03 2-2.2 PID = 8.1 ppm	No odours, staining or asbestos
								JBMW03 3-3.2 PID = 12.5 ppm	No odours, staining or asbestos
			4						
				4.00		CL	CLAY - Grey/orange/brown. Firm-stiff, medium dense, medium plasticity and damp	JBMW03 4-4.2 PID = 11 ppm	No odours, staining or asbestos
								JBMW03 5-5.2 PID = 12.3 ppm	No odours, staining or asbestos
				5.30		SG	Gravelly SAND - Orange. Loose-medium dense, damp with minor angular gravel inclusions.		
			6					JBMW03 6-6.2 PID = 12.2 ppm	No odours, staining or asbestos
	▼			7.00		SP	SAND - Orange/yellow. Homogenous, dense, rounded and saturated	JBMW03 7-7.2 PID = 13.6 ppm	No odours, staining or asbestos
	▼		8						
SFA								JBMW03 8-8.2 PID = 6 ppm	No odours, staining or asbestos
				8.90		SG	Gravelly SAND - Orange/yellow. Homogenous, dense, rounded and saturated. Inclusions of river gravels		
			10						
			12						
				12.10			Borehole JBMW03 terminated at 12.1m		

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBMW04

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: Henry Street

Date: 10:04:18 AM
Logged By: CB
Contractor: Terratest
Total Hole Depth (mbgs): 11.6
Bore Diameter (mm): 125

Eastings (GDA 94): 286586.3
Northings (GDA 94): 6262919
Zone/Area/Permit#:
Reference Level: AHD
Elevation (m): 27.59

Water Level Initial (mbgs): 6.8
Surface Finish: Gatic
Casing / Screen Type: Class 18 PVC - 50mm
Casing Bottom Depth (mbgs): 8.5
Screen Bottom Depth (mbgs): 11.5

Method	Water (mbgs)	Well Details	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
PT						Fill	ASHPHALT		
				0.10		Fill	Silty CLAY - Dark brown, heterogenous, low plasticity, dry. Inclusions of slag, fine gravels, tiles and glass	JBMW04 0.2-0.5 PID = 7.2 ppm	No odours, staining or asbestos
				0.50		CL	CLAY - Brown/yellow. Firm - stiff, homogenous, dry, medium plasticity		No odours, staining or asbestos
								JBMW04 1-1.2 PID = 7.4 ppm	No odours, staining or asbestos
			2	1.80		CL	CLAY - Yellow/grey. Firm-stiff, dry-damp, medium plasticity and mottled	JBMW04 2-2.2 PID = 7.2 ppm	No odours, staining or asbestos
				2.30		CL	CLAY - Red/grey. Medium plasticity, firm-stiff and mottled. Inclusions of black organic matter		
								JBMW04 3-3.2 PID = 7.3 ppm	No odours, staining or asbestos
				3.50		CL-SC	Clayey SAND - Grey/red/orange. Fine sand, dense, dry and mottling		
			4					JBMW04 4-4.2 PID = 7.5 ppm	No odours, staining or asbestos
				4.20		SW	SAND - Light brown. Fine grained, loose-medium dense, dry		
								JBMW04 4.4-4.5 PID = 7 ppm	No odours, staining or asbestos
				5.00		CL-SC	Clayey SAND - Brown, orange, dry and mottled		
			6					JBMW04 6-6.2 PID = 8.5 ppm	No odours, staining or asbestos
	▶			6.80		CL-SC	Sandy CLAY - Grey/orange. Wet-saturated, low-medium plasticity. Soft with mottling	JBMW04 7-7.2 PID = 8.4 ppm	No odours, staining or asbestos
	▶			7.50		CL-GC	Gravelly CLAY - Orange/white/brown. Heterogenous, saturated, soft. Igneous gravels.		
SFA			8					JBMW04 8-8.2 PID = 4.5 ppm	No odours, staining or asbestos
				10.80		SHALE	Weathered SHALE - Orange CLAY, homogenous and saturated.		
				11.60			Borehole JBMW04 terminated at 11.6m		
			10						
			12						

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBMW05/SV18

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: Henry Street

Date: 05-Nov-18
Logged By: CB
Contractor: Terratest
Total Hole Depth (mbgs): 10
Bore Diameter (mm): 125

Eastings (GDA 94): 295971.346
Northings (GDA 94): 6259469.147
Zone/Area/Permit#:
Reference Level: AHD
Elevation (m): 27.64

Surface Finish: Gatic
Construction: Class 18 PVC - 50mm
Probe Depth (mbgs): 4.7-5.0
Casing Bottom Depth (mbgs): 7.0
Screen Bottom Depth (mbgs): 10

Method	Depth (mbgs)	Contact (mbgs)	Lithological Class	Lithological Description	Samples / Tests / Remarks	Additional Observations
PT		0.05	Fill	ASPHALT		
		0.29	Fill	ASPHALT and CONCRETE		
			Fill	Sandy CLAY - Dark brown, heterogeneous, Medium Plasticity, Soft, Dry, Inclusions of Ash and Fine Road Base Gravels	JBMW05 0.3-0.4	No odours, staining or asbestos
					JBMW05 0.5-0.6	No odours, staining or asbestos
		0.80	CL	CLAY - Grey and Light Brown, Homogeneous, Medium Plasticity, Soft to Firm, Dry, No Inclusions	JBMW05 0.9-1.0	No odours, staining or asbestos
	2				JBMW05 1.9-2.0	No odours, staining or asbestos
		2.90	CL	CLAY - Red to Brown, Homogeneous, Medium Plasticity, Soft to Firm, Dry to Damp, No Inclusions	JBMW05 2.9-3.0	No odours, staining or asbestos
	4				JBMW05 3.9-4.0	No odours, staining or asbestos
		4.50	CL	CLAY - Red (grading to light red with depth), Homogeneous, Medium Plasticity, Soft to Firm, Dry, No Inclusions	JBMW05 4.9-5.0	No odours, staining or asbestos
	6				JBMW05 5.9-6.0	No odours, staining or asbestos
		6.50	CL-SC	Sandy CLAY - Red to Brown, heterogeneous, Medium Plasticity, Soft to Firm, Dry, No Inclusions	JBMW05 6.9-7.0	No odours, staining or asbestos
SFA		7.00	CL-GC	Gravelly Sandy CLAY - Heterogeneous, Low to Medium Plasticity, Soft to Firm, Saturated, Inclusions of River Gravels (fine gravels to cobbles)		
	8				JBMW05 7.9-8.0	No odours, staining or asbestos
	10	10.00		Borehole JBMW05 terminated at 10m		
	12					

Probe Depth - 4.7-5.0
Water Depth - 7.0m

WELL_JBSG SV - 2017.GPJ GINT STD AUSTRALIA.GDT 7-11-18

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBMW06

Project Number: 55073
Client: Penrith City Council
Project Name: Penrith
Site Address: 48 Belmore Street, Penrith

Date: 16-Nov-18
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 11.5
Bore Diameter (mm): 150

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Water Level Initial (mbgs): 7
Surface Finish: Gatic
Casing / Screen Type: Class 18 PVC - 50mm
Casing Bottom Depth (mbgs): 7
Screen Bottom Depth (mbgs): 10

Method	Water (mbgs)	Well Details	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Solid Flight Auger				0.10		Fill	ASPHALT - road base gravels		No odours, stains or ACM noted
				0.20		Fill	Clayey Gravel - dark brown, heterogeneous, dry to damp, loose, angular, fine to medium grained road base gravels		No odours, stains or ACM noted
						CL	CLAY - grey, red, brown, mottled, dry to damp, medium to high plasticity, soft to firm		
			2						
			4						No odours, stains or ACM noted
			6						
	▶			7.00		SC	Clayey SAND - orange, brown, heterogeneous, dry to damp, fine to medium grained, loose to medium dense		No odours, stains or ACM noted
				7.40		GS-GC	Sandy Clayey GRAVEL - orange, brown, heterogeneous, damp to wet, loose, river gravels		
			8						
			10						No odours, stains or ACM noted. Collapsing gravels and clay noted during well installation
				11.50			Borehole JBMW06 terminated at 11.5m		End of hole at program depth
			12						

WELL_JBSG WELL - 2017.GPJ GINT STD AUSTRALIA.GDT 19-11-18

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBMW07

Project Number: 55073
Client: Penrith City Council
Project Name: Penrith
Site Address: 48 Belmore Street, Penrith

Date: 16-Nov-18
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 10
Bore Diameter (mm): 150

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Water Level Initial (mbgs): 7.2
Surface Finish: Gatic
Casing / Screen Type: Class 18 PVC - 50mm
Casing Bottom Depth (mbgs): 7
Screen Bottom Depth (mbgs): 10

Method	Water (mbgs)	Well Details	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
Solid Flight Auger						Fill	ASPHALT - road base gravels		No odours, stains or ACM noted
				0.20		Fill	Clayey Gravel - dark brown, heterogeneous, dry to damp, loose, angular, fine to medium grained road base gravels		No odours, stains or ACM noted
			2	0.50		CL	CLAY - grey, red, orange, brown, mottled, dry to damp, medium to high plasticity, soft to firm		No odours, stains or ACM noted
			4						
			6	5.50		SW	SAND - orange, homogeneous, damp, fine to medium grained, loose to medium dense, sub angular to sub rounded grains		No odours, stains or ACM noted
	▶			7.20		GS	Sandy GRAVEL - orange, brown, heterogeneous, damp to wet, sub-angular to sub-rounded river gravels		No odours, stains or ACM noted
			8						
			10	10.00			Borehole JBMW07 terminated at 10m		End of hole at program depth
			12						

WELL_JBSG WELL - 2017.GPJ GINT STD AUSTRALIA.GDT 19-11-18

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

SV19

Project Number: 55073
Client: Penrith Council
Project Name: Penrith
Site Address: Henry Street, Penrith

Date: 05-Nov-18
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 5
Bore Diameter (mm): 150

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Surface Finish: Gatic
Construction: Nylon - Carbon Tube
Probe Depth (mbgs): 5
Probe Depth (mbgs):
Probe Depth (mbgs):

Method	Probe (mbgs)	Well Details	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
HA						Fill	ASPHALT		No odours, stains or ACM noted
SFA				0.30		CL	CLAY - light brown, grey, heterogeneous, dry, medium plasticity, firm, no inclusions		No odours, stains or ACM noted
			2						
				2.80		CL	CLAY - red, brown, homogeneous, dry to damp, medium plasticity, firm, no inclusions		No odours, stains or ACM noted
			4						
				5.00			Borehole SV19 terminated at 5m		End of hole at program depth
			6						
			8						
			10						
			12						

WELL JBSG SV - 2017.GPJ GINT STD AUSTRALIA.GDT 8-11-18

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Engineering Log - Non Cored Borehole

Project No.: PSM3158

Client:	JBS&G	Commenced:	07/05/2017
Project Name:	Central Park Village, Penrith	Completed:	07/05/2017
Hole Location:	114 to 146 Henry St & Allen Pl Carpark, Penrith	Logged By:	AK
Hole Position:	286646.0 m E 6262847.0 m N	Checked By:	AS

Drill Model and Mounting:	Commachio 405	Inclination:	-90°	RL Surface:	No survey
Hole Diameter:	125 mm	Bearing:		Datum:	AHD

Operator: Terratest

Drilling Information								Soil Description				Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Colour, structure, plasticity, additional	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa) 100 200 300 400 500	Structure and Additional Observations
AD/T							1			Asphalt & cemented road base.	M			
										Clayey SAND; dark grey and brown, medium grained, low to medium plasticity.		MD		0.10: Inferred Fill
										CLAY with some sand; light brown, medium plasticity, fine grained.		St		0.60: Inferred Natural
							2							
							3			CLAY with some sand and a trace of gravel; brown and dark orange, medium plasticity, fine to medium grained, sub-angular up to 2mm.		St		
							4			CLAY with a trace of sand; brown and dark orange, medium to high plasticity, fine to medium grained.		St		

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
SPT - Standard penetration test
PT - Push tube
AS - Auger Screwing

Penetration
No resistance through to refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Classification symbols and soil descriptions based on Unified Soil Classification System

Moisture Condition
D - Dry
M - Moist
W - Wet

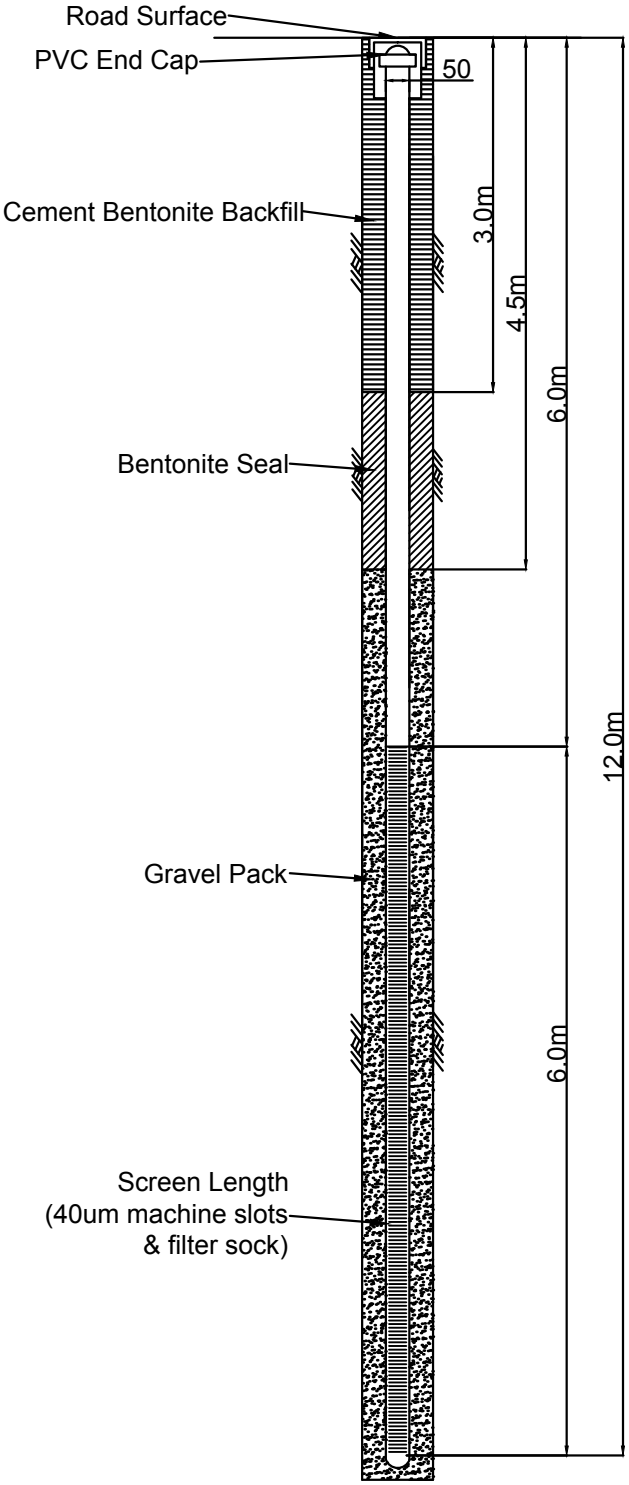
Consistency/Relative Density
VS - Very soft
S - Soft
F - Firm
St - Stiff
VSt - Very stiff
H - Hard
VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense
Ce - Cemented
C - Compact

See Explanatory Notes for details of abbreviations and basis of descriptions.

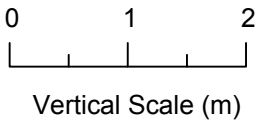
PSM 3.00.2 LIB:GLB Log IS_AU_NONCORE_BH_NZ_AU PSM3158 BH.GPJ <<DrawingFile>> 24/05/2017 10:59 8.30.003 Datgel Lab and In Situ Tool - DGD | Lib: PSM 3.00.2 2015-10-23 Prj: PSM 2.01 2015-04-07

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Notes:
Location: PSM01
Installation Date: 6/05/17
Supervised by: AK



Piezometer 1



JBS&G
114 to 146 Henry Street & Allen Place Carpark
Penrith, NSW

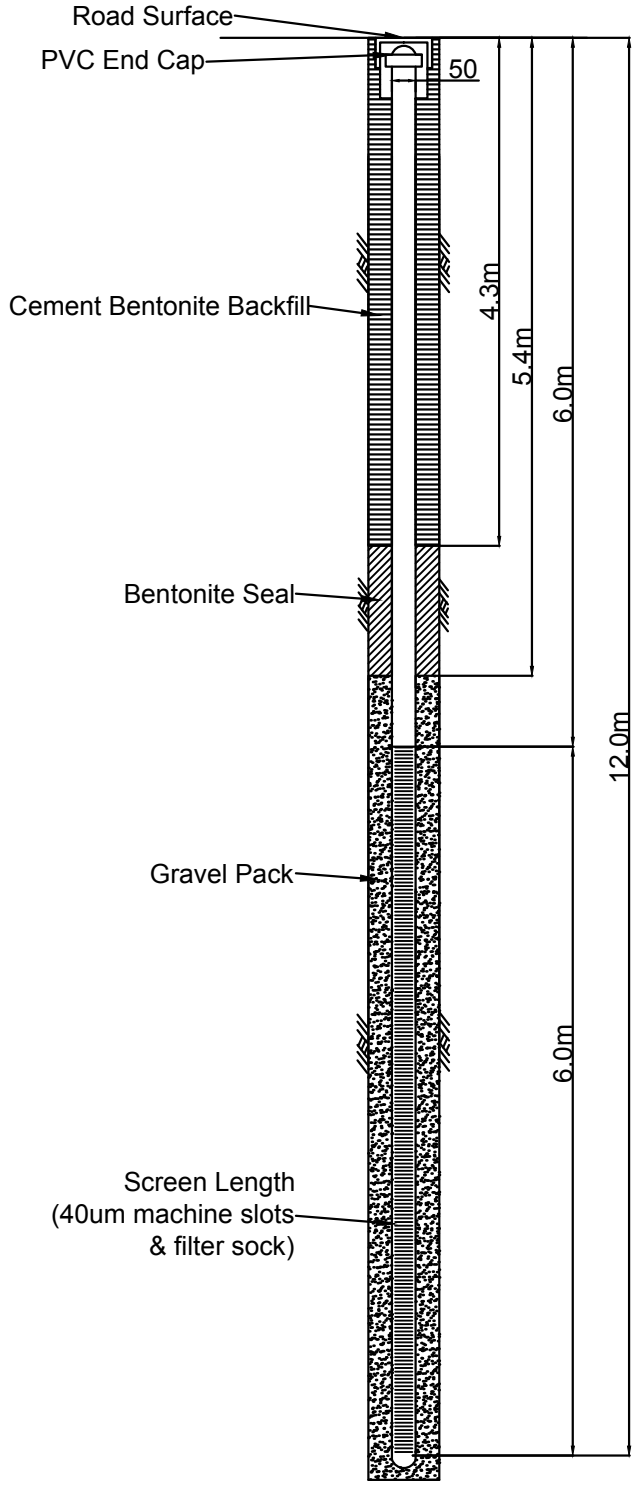
PIEZOMETER CONSTRUCTION RECORD
PIEZOMETER 1 (PSM01)

Pells Sullivan Meynink

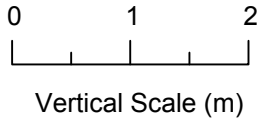
PSM3158-004R	Appendix B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Notes:
Location: PSM02
Installation Date: 7/05/17
Supervised by: AK



Piezometer 2



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114 to 146 Henry Street & Allen Place Carpark
Penrith, NSW

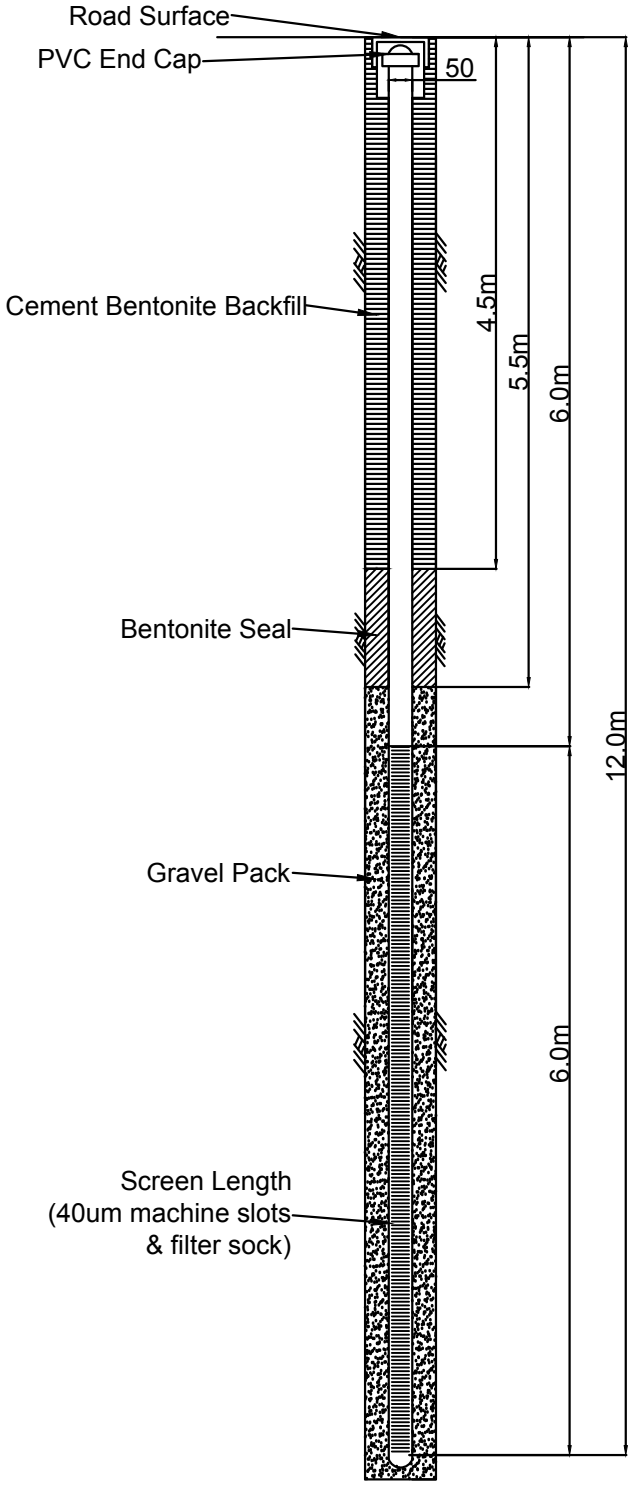
PIEZOMETER CONSTRUCTION RECORD
PIEZOMETER 2 (PSM02)

Pells Sullivan Meynink

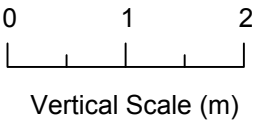
PSM3158-004R	Appendix B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Notes:
Location: PSM03
Installation Date: 6/05/17
Supervised by: AK



Piezometer 3



JBS&G
114 to 146 Henry Street & Allen Place Carpark
Penrith, NSW

PIEZOMETER CONSTRUCTION RECORD
PIEZOMETER 3 (PSM03)

Pells Sullivan Meynink

PSM3158-004R	Appendix B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Engineering Log - Non Cored Borehole

Project No.: PSM3158

Client:	JBS&G	Commenced:	06/05/2017
Project Name:	Central Park Village, Penrith	Completed:	06/05/2017
Hole Location:	114 to 146 Henry St & Allen Pl Carpark, Penrith	Logged By:	AK
Hole Position:	286617.0 m E 6262929.0 m N	Checked By:	AS

Drill Model and Mounting:	Commachio 405	Inclination:	-90°	RL Surface:	No survey		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Terratest

Drilling Information								***Soil Description***				***Observations***
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Colour, structure, plasticity, additional	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa) 100 200 300 400 500	Structure and Additional Observations
DT										Concrete slab.				
										Clayey SAND; dark grey and brown, medium grained, low to medium plasticity.		MD		0.16: Inferred Fill
										CLAY with some sand; grey and brown, medium to high plasticity, fine grained.				0.40: Inferred Natural
AD/T							1				M	St		
							2							
							3							
							4							

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
SPT - Standard penetration test
PT - Push tube
AS - Auger Screwing

Penetration
No resistance through to refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Classification symbols and soil descriptions based on Unified Soil Classification System

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very soft
S - Soft
F - Firm
St - Stiff
VSt - Very stiff
H - Hard
VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense
Ce - Cemented
C - Compact

See Explanatory Notes for details of abbreviations and basis of descriptions.

PSM 3.00.2 LIB:GLB Log IS_AU_NONCORE_BH_NZ_AU PSM3158 BH.GPJ <<DrawingFile>> 24/05/2017 10:59 8.30.003 Datgel Lab and In Situ Tool - DGD | Lib: PSM 3.00.2 2015-10-23 Prj: PSM 2.01 2015-04-07

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Engineering Log - Non Cored Borehole

Project No.: PSM3158

Client:	JBS&G	Commenced:	06/05/2017
Project Name:	Central Park Village, Penrith	Completed:	06/05/2017
Hole Location:	114 to 146 Henry St & Allen Pl Carpark, Penrith	Logged By:	AK
Hole Position:	286617.0 m E 6262929.0 m N	Checked By:	AS

Drill Model and Mounting:	Commachio 405	Inclination:	-90°	RL Surface:	No survey		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Terratest

Drilling Information								***Soil Description***				***Observations***
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Colour, structure, plasticity, additional	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa) 100 200 300 400 500	Structure and Additional Observations
AD/T							6			CLAY with some sand; grey and brown, medium to high plasticity, fine grained. *(continued)*	M	St		
							7							
							8							
							9			Clayey GRAVEL with some sand; brown, inferred sub-rounded up to 100mm, medium plasticity, fine grained.	W	VD		8.50: High resistance, rate of penetration significantly reduced Inferred GRAVEL unit

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
SPT - Standard penetration test
PT - Push tube
AS - Auger Screwing

Penetration
No resistance through to refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

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See Explanatory Notes for details of abbreviations and basis of descriptions.

PSM 3.00.2 LIB:GLB Log IS_AU_NONCORE_BH_NZ_AU PSM3158 BH.GPJ <<DrawingFile>> 24/05/2017 10:59 8.30.003 Datgel Lab and In Situ Tool - DGD | Lib: PSM 3.00.2 2015-10-23 Prj: PSM 2.01 2015-04-07

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Engineering Log - Non Cored Borehole

Project No.: PSM3158

Client:	JBS&G	Commenced:	06/05/2017
Project Name:	Central Park Village, Penrith	Completed:	06/05/2017
Hole Location:	114 to 146 Henry St & Allen Pl Carpark, Penrith	Logged By:	AK
Hole Position:	286617.0 m E 6262929.0 m N	Checked By:	AS

Drill Model and Mounting:	Commachio 405	Inclination:	-90°	RL Surface:	No survey		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Terratest

Drilling Information								***Soil Description***				***Observations***
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Colour, structure, plasticity, additional	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa) 100 200 300 400 500	Structure and Additional Observations
AD/T							11			Clayey GRAVEL with some sand; brown, inferred sub-rounded up to 100mm, medium plasticity, fine grained. *(continued)*	W	VD		
							12			SHALE; grey, inferred medium strength, moderately to slightly weathered.				
										Hole Terminated at 12.50 m				
							13							
							14							

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
SPT - Standard penetration test
PT - Push tube
AS - Auger Screwing

Penetration
No resistance through to refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
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SPT - Standard Penetration Test
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See Explanatory Notes for details of abbreviations and basis of descriptions.

PSM 3.00.2 LIB:GLB Log IS_AU_NONCORE_BH_NZ_AU PSM3158 BH.GPJ <<DrawingFile>> 24/05/2017 10:59 8.30.003 Datgel Lab and In Situ Tool - DGD | Lib: PSM 3.00.2 2015-10-23 Prj: PSM 2.01 2015-04-07

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Engineering Log - Non Cored Borehole

Project No.: PSM3158

Client:	JBS&G	Commenced:	07/05/2017
Project Name:	Central Park Village, Penrith	Completed:	07/05/2017
Hole Location:	114 to 146 Henry St & Allen Pl Carpark, Penrith	Logged By:	AK
Hole Position:	286646.0 m E 6262847.0 m N	Checked By:	AS

Drill Model and Mounting:	Commachio 405	Inclination:	-90°	RL Surface:	No survey
Hole Diameter:	125 mm	Bearing:		Datum:	AHD Operator: Terratest

Drilling Information								Soil Description				Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Colour, structure, plasticity, additional	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa) 100 200 300 400 500	Structure and Additional Observations
AD/T							6			CLAY with a trace of sand; brown and dark orange, medium to high plasticity, fine to medium grained. *(continued)*	M	St		
							7							
							8			Clayey sandy GRAVEL; brown, sub-rounded to rounded up to 100mm, medium plasticity, fine to medium grained.	W	VD		8.10: High resistance, rate of penetration significantly reduced Inferred GRAVEL unit
							9							

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
SPT - Standard penetration test
PT - Push tube
AS - Auger Screwing

Penetration
No resistance through to refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
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Consistency/Relative Density
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H - Hard
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See Explanatory Notes for details of abbreviations and basis of descriptions.

PSM 3.00.2 LIB:GLB Log IS_AU_NONCORE_BH_NZ_AU PSM3158 BH.GPJ <<DrawingFile>> 24/05/2017 10:59 8.30.003 Datgel Lab and In Situ Tool - DGD | Lib: PSM 3.00.2 2015-10-23 Prj: PSM 2.01 2015-04-07

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Engineering Log - Non Cored Borehole

Project No.: PSM3158

Client:	JBS&G	Commenced:	07/05/2017
Project Name:	Central Park Village, Penrith	Completed:	07/05/2017
Hole Location:	114 to 146 Henry St & Allen Pl Carpark, Penrith	Logged By:	AK
Hole Position:	286646.0 m E 6262847.0 m N	Checked By:	AS

Drill Model and Mounting:	Commachio 405	Inclination:	-90°	RL Surface:	No survey
Hole Diameter:	125 mm	Bearing:		Datum:	AHD

Operator: Terratest

Drilling Information								***Soil Description***				***Observations***
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Colour, structure, plasticity, additional	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa) 100 200 300 400 500	Structure and Additional Observations
AD/T							11			Clayey sandy GRAVEL; brown, sub-rounded to rounded up to 100mm, medium plasticity, fine to medium grained. *(continued)*				
							12					VD		
							13				W			
										SHALE; grey, inferred medium strength, moderately to slightly weathered.				13.50: Auger refusal Inferred Bedrock, commence coring
							14			Continued on cored borehole sheet				

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
SPT - Standard penetration test
PT - Push tube
AS - Auger Screwing

Penetration
No resistance through to refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Classification symbols and soil descriptions based on Unified Soil Classification System

Moisture Condition
D - Dry
M - Moist
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Consistency/Relative Density
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H - Hard
VL - Very loose
L - Loose
MD - Medium dense
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Ce - Cemented
C - Compact

See Explanatory Notes for details of abbreviations and basis of descriptions.

PSM 3.00.2 LIB:GLB Log IS_AU_NONCORE_BH_NZ_AU PSM3158 BH.GPJ <<DrawingFile>> 24/05/2017 10:59 8.30.003 Datgel Lab and In Situ Tool - DGD | Lib: PSM 3.00.2 2015-10-23 Prj: PSM 2.01 2015-04-07

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Engineering Log - Cored Borehole

Project No.: PSM3158

Client:	JBS&G	Commenced:	07/05/2017
Project Name:	Central Park Village, Penrith	Completed:	07/05/2017
Hole Location:	114 to 146 Henry St & Allen Pl Carpark, Penrith	Logged By:	AK
Hole Position:	286646.0 m E 6262847.0 m N	Checked By:	AS

Drill Model and Mounting:	Commachio 405	Inclination:	-90°	RL Surface:	No survey		
Barrel Type and Length:	NMLC 3 m	Bearing:		Datum:	AHD	Operator:	Terratest

Drilling Information							***Rock Substance***																	***Rock Mass Defects***		
Method	Water	TCR (%)	RQD (%)	SAMPLES & FIELD TESTS	RL (m)	Depth (m)	Graphic Log	Material Description ROCK TYPE: Colour, grain size, structure (texture, fabric, mineral composition, hardness, alteration, cementation, etc as applicable)	Weathering					Strength Is(50) ● - Axial ○ - Diametral										Defect Spacing (mm)					Defect Descriptions / Comments Description, alpha/beta, infilling or coating, shape, roughness, thickness, other
									EW	HW	MW	SW	F	EL	<0.03	VL	0.1	L	0.3	M	1	H	3	VH	10	EH	<20	60	200	600	1000	
						11																										
						12																										
						13																										
								Continued from non-cored borehole sheet																								
NMLC		95.5	52.7			14		NO CORE (85mm).																								
								SHALE; grey and black, thinly laminated at 0 to 5°, laminations of 2 to 5mm, medium to high strength, slightly weathered to fresh.																								

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3- Wireline core (63.5 mm)
PQ3- Wireline core (85.0 mm)
SPT- Standard penetration test
PT - Push tube

Water
Inflow
Partial Loss
Complete Loss

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

See Explanatory Notes for details of abbreviations and basis of descriptions.

Weathering
EW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
F - Fresh

Strength
EL - Extremely Low
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Surface
SZ - Shear Zone
BP - Bedding parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

PSM 3.00.2 LIB.GLB Log IS_AU_CORE_BH_PSM PSM3158 BH.GPJ <<DrawingFile>> 24/05/2017 11:00 8.30.003 Datgel Lab and In Situ Tool - DGD | Lib: PSM 3.00.2 2015-10-23 Prj: PSM 2.01 2015-04-07

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Engineering Log - Cored Borehole

Project No.: PSM3158

Client:	JBS&G	Commenced:	07/05/2017
Project Name:	Central Park Village, Penrith	Completed:	07/05/2017
Hole Location:	114 to 146 Henry St & Allen Pl Carpark, Penrith	Logged By:	AK
Hole Position:	286646.0 m E 6262847.0 m N	Checked By:	AS

Drill Model and Mounting:	Commachio 405	Inclination:	-90°	RL Surface:	No survey		
Barrel Type and Length:	NMLC 3 m	Bearing:		Datum:	AHD	Operator:	Terratest

Drilling Information							***Rock Substance***						***Rock Mass Defects***	
Method	Water	TCR (%)	RQD (%)	SAMPLES & FIELD TESTS	RL (m)	Depth (m)	Graphic Log	Material Description ROCK TYPE: Colour, grain size, structure (texture, fabric, mineral composition, hardness, alteration, cementation, etc as applicable)	Weathering EW HW MW SW F	Strength Is(50) ● - Axial ○ - Diametral EL <0.03 VL 0.1 L 0.3 M 1 H 3 VH 10 EH	Defect Spacing (mm) <20 60 200 600 1000	Defect Descriptions / Comments Description, alpha/beta, infilling or coating, shape, roughness, thickness, other
NMLC		95.5	52.7					SHALE; grey and black, thinly laminated at 0 to 5°, laminations of 2 to 5mm, medium to high strength, slightly weathered to fresh.*(continued)*				
								Hole Terminated at 15.50 m				
						16						
						17						
						18						
						19						

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
HQ3- Wireline core (63.5 mm)
PQ3- Wireline core (85.0 mm)
SPT- Standard penetration test
PT - Push tube

Water
Inflow
Partial Loss
Complete Loss

Graphic Log/Core Loss
Core recovered (hatching indicates material)
No core recovery

See Explanatory Notes for details of abbreviations and basis of descriptions.

Weathering
EW - Extremely Weathered
HW - Highly Weathered
MW - Moderately Weathered
SW - Slightly Weathered
F - Fresh

Strength
EL - Extremely Low
VL - Very Low
L - Low
M - Medium
H - High
VH - Very High
EH - Extremely High

Defect Type
FT - Fault
SS - Shear Surface
SZ - Shear Zone
BP - Bedding parting
SM - Seam
IS - Infilled Seam
JT - Joint
CO - Contact
CZ - Crushed Zone
VN - Vein
FZ - Fracture Zone
BSH - Bedding Shear
DB - Drilling Break

Infilling/Coating
CN - Clean
SN - Stain
VN - Veneer
CO - Coating
RF - Rock fragments
G - Gravel
S - Sand
Z - Silt
CA - Calcite
CL - Clay
FE - Iron
QZ - Quartz
X - Carbonaceous

Roughness
SL - Slickensided
POL - Polished
S - Smooth
RF - Rough
VR - Very Rough

Shape
PR - Planar
CU - Curved
UN - Undulating
ST - Stepped
IR - Irregular

PSM 3.00.2 LIB.GLB Log IS_AU_CORE_BH_PSM PSM3158 BH.GPJ <<DrawingFile>> 24/05/2017 11:00 8.30.003 Datgel Lab and In Situ Tool - DGD | Lib: PSM 3.00.2 2015-10-23 Prj: PSM 2.01 2015-04-07

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Version: 1, Version Date: 14/04/2021

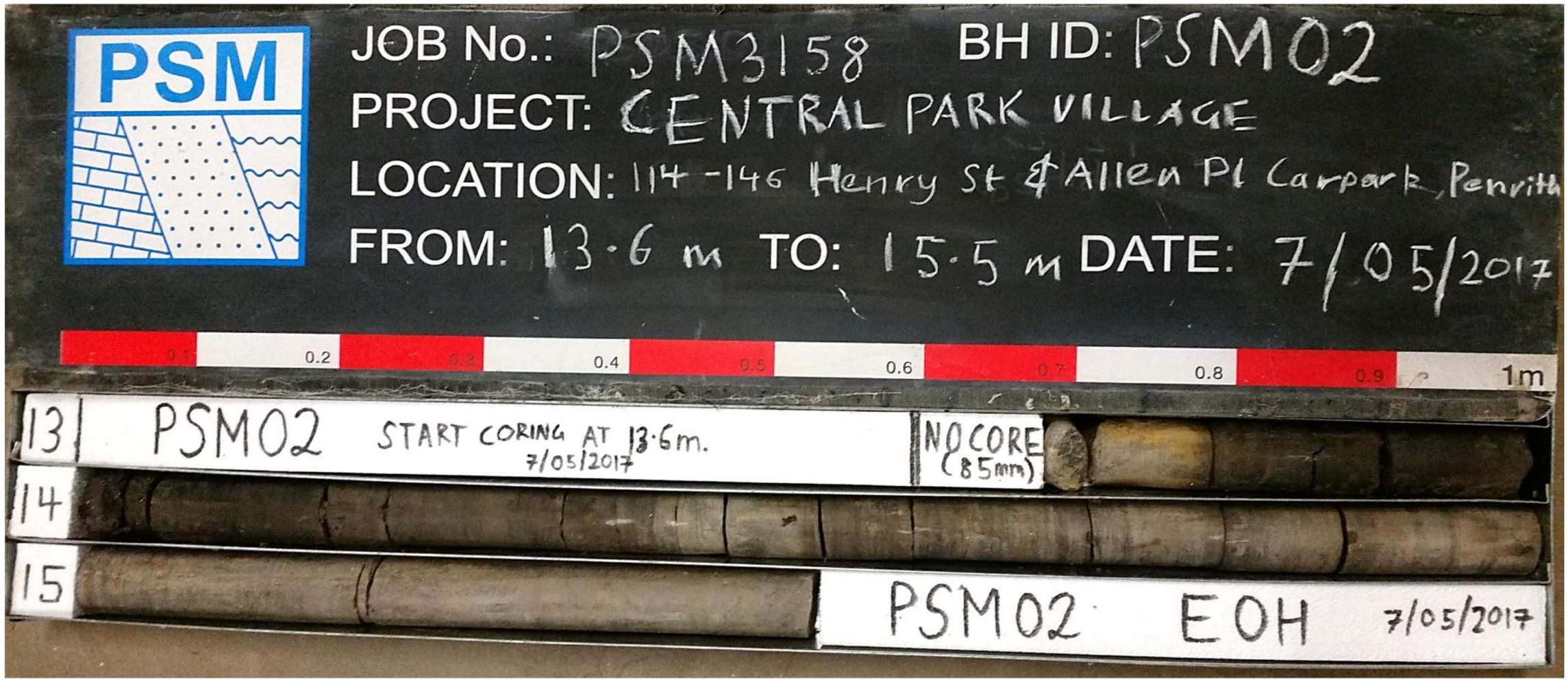

Photo 1: PSM02 Core, Depth 13.6 m - 15.5 m

JBS&G	
Central Park Village	
Penrith, NSW	
GEOTECHNICAL INVESTIGATION CORE PHOTOGRAPHS (PSM02)	
PSM3158-004R	**Appendix A**

Borehole ID

PSM03

Engineering Log - Non Cored Borehole

Project No.: PSM3158

Client:	JBS&G	Commenced:	06/05/2017
Project Name:	Central Park Village, Penrith	Completed:	06/05/2017
Hole Location:	114 to 146 Henry St & Allen Pl Carpark, Penrith	Logged By:	AK
Hole Position:	286759.0 m E 6262847.0 m N	Checked By:	AS

Drill Model and Mounting:	Commachio 405	Inclination:	-90°	RL Surface:	No survey		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Terratest

Drilling Information								***Soil Description***				***Observations***
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Colour, structure, plasticity, additional	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa)	Structure and Additional Observations
AD/T							0			Asphalt & cemented road base.	M			0.10: Inferred Fill
										Clayey SAND with some gravel; grey and brown, medium grained, low plasticity, sub-angular gravel up to 5mm.		MD		
							1			Clayey SAND; brown, fine to medium grained, low to medium plasticity.		MD		0.80: Inferred Natural
							2			Sandy CLAY with a trace of gravel; brown, medium plasticity, fine to medium grained, sub-angular up to 5mm.		St		
							3			CLAY; light brown, medium to high plasticity.		VSt		
							4							

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
SPT - Standard penetration test
PT - Push tube
AS - Auger Screwing

Penetration
No resistance through to refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
D - Disturbed Sample
SPT - Standard Penetration Test
ES - Environmental Sample
TW - Thin Walled
LB - Large Disturbed Sample

Classification symbols and soil descriptions based on Unified Soil Classification System

Moisture Condition
D - Dry
M - Moist
W - Wet

Consistency/Relative Density
VS - Very soft
S - Soft
F - Firm
St - Stiff
VSt - Very stiff
H - Hard
VL - Very loose
L - Loose
MD - Medium dense
D - Dense
VD - Very dense
Ce - Cemented
C - Compact

See Explanatory Notes for details of abbreviations and basis of descriptions.

PSM 3.00.2 LIB:GLB Log IS_AU_NONCORE_BH_NZ_AU PSM3158 BH.GPJ <<DrawingFile>> 24/05/2017 10:59 8.30.003 Datgel Lab and In Situ Tool - DGD | Lib: PSM 3.00.2 2015-10-23 Prj: PSM 2.01 2015-04-07

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Engineering Log - Non Cored Borehole

Project No.: PSM3158

Client:	JBS&G	Commenced:	06/05/2017
Project Name:	Central Park Village, Penrith	Completed:	06/05/2017
Hole Location:	114 to 146 Henry St & Allen Pl Carpark, Penrith	Logged By:	AK
Hole Position:	286759.0 m E 6262847.0 m N	Checked By:	AS

Drill Model and Mounting:	Commachio 405	Inclination:	-90°	RL Surface:	No survey		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Terratest

Drilling Information								Soil Description					Observations
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Colour, structure, plasticity, additional	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa) 100 200 300 400 500	Structure and Additional Observations
AD/T							6			CLAY; light brown, medium to high plasticity. *(continued)*	M	VSt		
							7							
							8							
							9			Clayey GRAVEL with some sand; brown, inferred sub-rounded up to 100mm, medium plasticity, fine to medium grained.	W	VD		9.00: High resistance, rate of penetration significantly reduced Inferred GRAVEL unit

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
SPT - Standard penetration test
PT - Push tube
AS - Auger Screwing

Penetration
No resistance through to refusal

Water
Inflow
Partial Loss
Complete Loss

Samples and Tests
U - Undisturbed Sample
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Document Set ID: 9547379
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Engineering Log - Non Cored Borehole

Project No.: PSM3158

Client:	JBS&G	Commenced:	06/05/2017
Project Name:	Central Park Village, Penrith	Completed:	06/05/2017
Hole Location:	114 to 146 Henry St & Allen Pl Carpark, Penrith	Logged By:	AK
Hole Position:	286759.0 m E 6262847.0 m N	Checked By:	AS

Drill Model and Mounting:	Commachio 405	Inclination:	-90°	RL Surface:	No survey		
Hole Diameter:	125 mm	Bearing:		Datum:	AHD	Operator:	Terratest

Drilling Information								***Soil Description***				***Observations***
Method	Penetration	Support	Water	Samples Tests Remarks	Recovery	RL (m)	Depth (m)	Graphic Log	Classification Symbol	Material Description SOIL NAME: Colour, structure, plasticity, additional	Moisture Condition	Consistency / Relative Density	Hand Penetrometer UCS (kPa) 100 200 300 400 500	Structure and Additional Observations
AD/T							11			Clayey GRAVEL with some sand; brown, inferred sub-rounded up to 100mm, medium plasticity, fine to medium grained. *(continued)*	W	VD		
							12			SHALE; grey, inferred medium strength, moderately to slightly weathered.				
										Hole Terminated at 12.50 m				
							13							
							14							

Method
AD/T - Auger drilling TC bit
AD/V - Auger drilling V bit
WB - Washbore
SPT - Standard penetration test
PT - Push tube
AS - Auger Screwing

Penetration
No resistance through to refusal

Water
Inflow
Partial Loss
Complete Loss

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

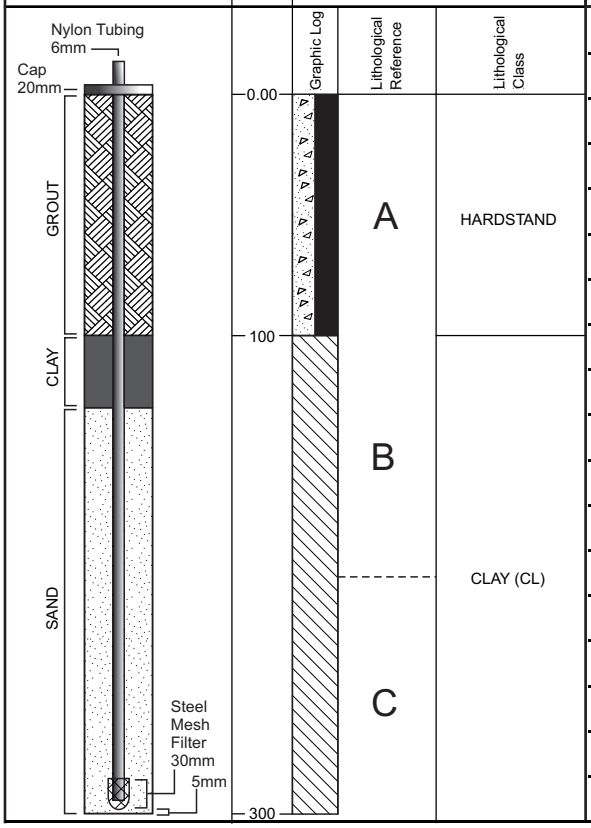
SUB-SLAB SOIL VAPOUR - APRIL 2018

Project Number: 52372
Client: Penrith City Council
Project Name: Central Park Village
Site Address: 14 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

Date: 17-Apr-2018
Logged By: RH/CB
Contractor:
Total Hole Depth (mbgs): 0.3m
Bore Diameter (mm): 100

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#: MGA Zone 56
Reference Level:
Elevation (m):

Surface Finish: Gatic
Construction: 6mm Nylon Tubing
Probe Depth (mbgs): 0.3



SUB-SLAB SOIL VAPOUR SAMPLING SV01 - SV17

SURFACE	LOCATION	1	2	A	B	C
Concrete	SV01	0-200	CL	0-150	150-200	200-300
Concrete	SV02	0-200	CL	0-150	150-200	200-300
Concrete	SV03	0-200	CL	0-150	150-200	200-300
Concrete	SV04	0-200	CL	0-150	150-200	200-300
Concrete	SV05	0-200	CL	0-150	150-200	200-300
Concrete	SV06	0-200	CL	0-150	150-200	200-300
Asphalt	SV07	0-100	CL	0-100	100-150	150-300
Asphalt	SV08	0-100	CL	0-100	100-150	150-300
Concrete	SV09	0-200	CL	0-150	150-200	200-300
Concrete	SV10	0-200	CL	0-150	150-200	200-300
Concrete	SV11	0-200	CL	0-150	150-200	200-300
Concrete	SV12	0-200	CL	0-150	150-200	200-300
Concrete	SV13	0-200	CL	0-150	150-200	200-300
Concrete	SV14	0-200	CL	0-150	150-200	200-300
Concrete	SV15	0-150	CL	0-100	100-150	150-300
Asphalt	SV16	0-100	CL	0-100	100-150	150-300
Concrete	SV17	0-200	CL	0-150	150-200	200-300

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

EXPLANATION SHEET - SOIL DESCRIPTION

DEFINITIONS

Soil:
In engineering terms, soil includes every type of uncemented or partially cemented inorganic or organic material found in the ground. In practice, if the material can be remoulded or disintegrated by hand in its field condition or in water it is described as a soil. Other materials are described using rock description terms.

Classification symbol & soil name:
Soils are described in accordance with the Unified Soil Classification (UCS) as shown in the table on Sheet 2.

Support:
C - Casing
T - Timbering

See rock description on Sheet 3 for method and samples / field test definitions.

PARTICLE SIZE DESCRIPTIVE TERMS

NAME	SUBDIVISION	SIZE
Boulders		>200 mm
Cobbles		63 mm to 200 mm
Gravel	coarse	20 mm to 63 mm
	medium	6 mm to 20 mm
	fine	2.36 mm to 6 mm
Sand	coarse	600 µm to 2.36 mm
	medium	200 µm to 600 µm
	fine	75 µm to 200 µm

MOISTURE CONDITION

CONDITION	FIELD GUIDE
Dry	Looks and feels dry. Cohesive and cemented soils are hard, friable or powdery. Uncemented granular soils run freely through hands.
Moist	Soil feels cool and darkened in colour. Cohesive soils can be moulded. Granular soils tend to cohere
Wet	As for moist but with free water forming on hands when handles

CONSISTENCY OF COHESIVE SOILS

TERM	UNDRAINED STRENGTH SU (kPa)	FIELD GUIDE
Very Soft	<12	A finger can be pushed well into the soil with little effort
Soft	12 – 25	A finger can be pushed into the soil to about 25mm depth
Firm	25 – 50	The soil can be indented about 5mm with the thumb, but not penetrated
Stiff	50 – 100	The surface of the soil can be indented with the thumb, but not penetrated
Very Stiff	100 – 200	The surface of the soil can be marked, but not indented with thumb pressure
Hard	>200	The surface of the soil can be marked only with the thumbnail

DENSITY OF GRANULAR SOILS

TERM	DENSITY INDEX (%)
Very loose	<15
Loose	15 – 35
Medium Dense	35 – 65
Dense	65 – 85
Very Dense	>85

Where no SPT data, the following descriptions are used:

Loose: Can be removed from exposure by hand in a disaggregated form.

Compact (C) Only removed from exposure with an implement, material readily disaggregated by physical means.

Cemented (Ce) Only removed from exposure with an implement, material cannot be disintegrated / remoulded in air/ water.

MINOR COMPONENTS

TERM	ASSESSMENT GUIDE	PROPORTION OF MINOR COMPONENT
Trace of	Presence just detectable by feel or eye, but soil properties little or no different to general properties of primary component.	Coarse grained soils: <5% Fine grained soils: <15%
With some	Presence easily detected by feel or eye, soil properties little different to general properties of primary component.	Coarse grained soils: 5 - 12% Fine grained soils: 15 - 30%

SOIL STRUCTURE

ZONING		CEMENTING	
Layers	Continuous across exposure of sample	**Weakly Cemented**	Easily broken up by hand in air or water
Lenses	Discontinuous layers of lenticular shape	**Moderately Cemented**	Effort is required to break up the soil by hand in air or water
Pockets	Irregular inclusions of different material	**Cemented**	Only removed from exposure by implement, material does not disaggregate
		Compact	Only removed from exposure by implement, material readily disaggregated by physical means

GEOLOGICAL ORIGIN

Weathered in place soils:

Extremely weathered — Structure and fabric of parent rock visible

Residual Soil — Structure and fabric of parent rock not visible

Transported soil:

Aeolian — Deposited by wind

Alluvium — Deposited by streams and rivers

Colluvium — Deposited on slopes (transported downslope by gravity)

Lacustrine — Deposited by lakes

Marine — Deposited in ocean basins, bays, beached and estuaries

Man Made:

Fill — Fill may be significantly more variable between tested locations than naturally occurring soils

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

EXPLANATION SHEET - SOIL DESCRIPTION

SOIL CLASSIFICATION INCLUDING IDENTIFICATION AND DESCRIPTION

FIELD IDENTIFICATION PROCEDURES (EXCLUDING PARTICLES LARGER THAN 60 mm AND BASING FRACTIONS ON ESTIMATED MASS)*							USC	PRIMARY NAME
COARSE GRAINED SOILS More than 50% of materials less than 63 mm is larger than 0.075 mm	(A 0.475 mm particle is about the smallest particle visible to the naked eye)	GRAVELS More than half of coarse fraction is larger than 2.0 mm	CLEAN GRAVELS (Little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes.			GW	GRAVEL
				Predominantly one size or a range of sizes with more intermediate sizes missing.			GP	GRAVEL
			GRAVELS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below)			GM	SILTY GRAVEL
				Plastic fines (for identification procedures see CL below)			GC	CLAYEY GRAVEL
		SANDS More than half of coarse fraction is smaller than 2.0 mm	CLEAN SANDS (Little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate sizes missing			SW	SAND
				Predominantly one size or a range of sizes with some intermediate sizes missing.			SP	SAND
			SANDS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below).			SM	SILTY SAND
				Plastic fines (for identification procedures see CL below).			SC	CLAYEY SAND
FINE GRAINED SOILS More than 50% of material less than 63 mm is smaller than 0.075 mm			IDENTIFICATION PROCEDURES ON FRACTIONS <0.2 mm.					
		SILTS & CLAYS Liquid limit less than 50	**Dry strength**	**Dilatancy**	**Toughness**			
			None to Low	Quick to slow	None		ML	SILT
			Medium to High	None	Medium		CL	CLAY
			Low to medium	Slow to very slow	Low		OL	ORGANIC SILT
		SILTS & CLAYS Liquid limit greater than 50	Low to medium	Slow to very slow	Low to medium		MH	SILT
			High	None	High		CH	CLAY
			Medium to High	None	Low to medium		OH	ORGANIC CLAY
HIGHLY ORGANIC SOIL Readily identified by colour, odour, spongy feel and frequently by fibrous texture							Pt	PEAT

• Low plasticity – Liquid Limit W_L less than 35%. • Medium plasticity – W_L between 35% and 50%.

*Taken from AS1726 (1993)

COMMON DEFECTS IN SOIL

TERM	DEFINITION
Parting	A surface or crack across which the soil has little or no tensile strength. Parallel or sub parallel to layering (e.g. bedding). May be open or closed.
Joint	A surface or crack across which the soil has little or no tensile strength but which is not parallel or sub parallel to layering. May be open or closed. The term 'fissure' may be used for irregular joints <0.2 m in length.
Sheared Zone	Zone in clayey soil with roughly parallel near planar, curved or undulating boundaries containing closely spaced, smooth or slickensided, curved intersecting joints which divide the mass into lenticular or wedge shaped blocks.
Sheared Surface	A near planar curved or undulating, smooth, polished or slickensided surface in clayey soil. The polished or slickensided surface indicates that movement (in many cases very little) has occurred along the defect.
Softened Zone	A zone in clayey soil, usually adjacent to a defect in which the soil has a higher moisture content than elsewhere.
Tube	Tubular cavity. May occur singly or as one of a large number of separate or inter-connected tubes. Walls often coated with clay or strengthened by denser packing of grains. May contain organic matter
Tube Cast	Roughly cylindrical elongated body of soil different from the soil mass in which it occurs. In some cases, the soil that makes up the tube cast is cemented.
Infilled Seam	Sheet or wall like body of soil substance or mass with roughly planar to irregular near parallel boundaries that cuts through a soil mass. Formed by infilling of open joints.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

EXPLANATION SHEET - ROCK DESCRIPTION

DEFINITIONS

Rock Substance:
In engineering terms rock substance is any naturally occurring aggregate of minerals and organic material which cannot be disintegrated or remoulded by hand in air or water. Other material is described using soil descriptive terms. Effectively homogenous material may be isotropic or anisotropic.

Defect:
Discontinuity or break in the continuity of a substance or substances.

Mass:
A body of material that is not effectively homogeneous. It can consist of two or more substances without defects, or one or more substances with one or more defects.

Method:

AD/T	Auger drilling with tcbit
AD/V	Auger drilling with vbit
AS	Auger screwing
AT	Air track
B	Dozer blade
BH	Backhoe bucket
CT	Cable tool
DB	Washbore drag bit
DT	Diatube
E	Excavator
EH	Excavator with hammer
HA	Hang auger
HMLC	HMLC core barrel
HQ3	Coring 63.5mm diameter, triple tube, wireline
MZ	Mazier
N	Natural exposure
NMLC	NMLC core barrel
NQ3	Coring 45.1mm diameter, triple tube, wireline
PQ3	Coring 83.1mm diameter, triple tube, wireline
Pushed SPT	Pushed SPT
PT	Push tube
R	Ripper
RR	Rock roller
SPT	Driven SPT
WB	Washbore
X	Existing excavation

Core Quality:

TCR	Total Core Recovered (%)
RQD	Rock Quality Designation (%)

Samples and Field Tests:

B	Bulk Disturbed Sample
BLK	Block sample
C	Core sample
CBR	CBR mould sample
D	Small disturbed sample
ES	Soil sample for environmental testing
EW	Water sample for environmental testing
G	Gas sample
LB	Large bulk disturbed sample
M	Mazier type sample
P	Piston sample
SPT	Standard Penetration Test
U	Undisturbed push in sample
W	Water sample

Rock Strength:

A	Axial point load test result (Is50)
D	Diametral point load test result (Is50)

Water:

▻ Inflow
◅ Partial Loss
◄ Complete Loss

SUBSTANCE DESCRIPTIVE TERMS

Rock name:
Simple rock names are used rather than precise geological classification

Particle size (for sandstone):
Coarse - Mainly 0.6mm to 2mm
Medium - Mainly 0.2mm to 0.6mm
Fine - Mainly 0.05mm (just visible) to 0.2mm

Fabric:
Massive - No layering or penetrative fabric
Indistinct - Layering or fabric visible. Little effect on properties
Distinct - Layering or fabric is easily visible. Rock breaks more easily parallel to layering of fabric

Bedding:
Thinly Laminated - <6mm
Laminated - 6 – 20mm
Very Thinly Bedded - 20 – 60mm
Thinly Bedded - 60 – 200mm
Medium Bedded - 200 – 600mm
Thickly Bedded - 600 – 2000mm
Very Thickly Bedded - >2000mm

ROCK SUBSTANCE STRENGTH

ABBR	TERM	POINT LOAD INDEX, IS50 (MPA)	FIELD GUIDE
EL	Extremely Low	≤0.03	Easily remoulded by hand to a material with soil properties
VL	Very Low	>0.03≤0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with a knife; pieces up to 30mm thick can be broken by finger pressure.
L	Low	>0.1≤0.3	Easily scored with a knife; indentations 1mm to 3mm show with firm bows of a pick point; has a dull sound under hammer. Pieces of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
M	Medium	>0.3≤1.0	Readily scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
H	High	>1≤3	A piece of core 150mm long by 50mm cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
VH	Very High	>3≤10	Hand specimen breaks after more than one blow of a pick; rock rings under hammer.
EH	Extremely High	>10	Specimen requires many blows with geological pick to break; rock rings under hammer.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

EXPLANATION SHEET - ROCK DESCRIPTION

CLASSIFICATION OF WEATHERING

ABBR	TERM	FIELD GUIDE
F	Fresh	Rock substance unaffected by weathering
SW	Slightly Weathered	Rock substance affected by weathering to the extent that partial staining or partial discolouration of the rock substance (usually by limonite) has taken place. The colour and texture of the fresh rock is recognisable; strength properties are essentially those of the fresh rock substance
MW	Moderately Weathered	The whole of the rock substance is discoloured, usually by iron staining or bleaching, to the extent that the colour of the fresh rock is no longer recognisable.
HW	Highly Weathered	Rock strength is changed by weathering. The whole of the rock substance is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Some minerals are decomposed to clay minerals. Porosity may be increased by leaching or may be decreased due to the deposition of minerals in pores.
EW	Extremely Weathered	Material is weathered to such an extent that it has soil properties, i.e.; it either disintegrates or can be remoulded in water. Original rock fabric still visible.

COMMON DEFECTS IN ROCK MASS

ABBR	TERM	FIELD GUIDE
FT	Fault	Fracture long which displacement is recognisable
SS	Shear Seam	A fracture along which movement has taken place but no displacement is recognisable. Evidence for movement may be slickensides, polishing and/or clay gouge
SZ	Sheared Zone	Zone of multiple closely spaced fracture planes with roughly parallel planar boundaries usually forming blocks of lenticular or wedge shaped intact material. Fractures are typically smooth, polished or slickensided; and curved
BP	Bedding Parting	Arrangement in layers of mineral grains or crystals parallel to surface of deposition along which a continuous observable parting occurs
SM	Seam	Seam of soil substance, often with gradational boundaries. Formed by weathering of the rock substance in place
IS	Infilled Seam	Seam of soil substance usually with distinct roughly parallel boundaries formed by the migration of soil into an open cavity or joint, infilled seams less than 1mm thick may be described as veneer or coating on joint surface
JT	Joint	A single fracture across which rock has little or no tensile strength and is not obviously related to rock fabric
CO	Contact	Surface between two lithologies
CZ	Crushed Zone	Zone with roughly parallel, planar boundaries (commonly slickensided) containing disoriented usually angular rock fragments of variable size often in a soil matrix.
VN	Vein	Fracture in which a tabular or sheet-like body of minerals have been intruded
FZ	Fractured Zone	A zone of closely spaced defects (mainly joints, bedding, cleavage and/or schistosity) comprised of core lengths in the order of 50mm or less.
BSH	Bedding Shear	A shear formed along a bedding plane
DB	Drilling Break	Drilling induced break

SHAPE TERMS

ABBR	TERM	FIELD GUIDE
PR	Planar	The defect does not vary in orientation
CU	Curved	The defect has a gradual change in orientation
UN	Undulating	The defect has a wavy surface
ST	Stepped	The defect has one or more well defined steps
IR	Irregular	The defect has many sharp changes of orientation

ROUGHNESS TERMS

ABBR	TERM	FIELD GUIDE
SL	Slickensided	Grooved or striated surface, usually polished
POL	Polished	Shiny smooth surface
S	Smooth	Smooth to touch. Few or no surface irregularities
RF	Rough	Many small surface irregularities (amplitude generally less than 1mm). Feels like fine to coarse sand paper.
VR	Very Rough	Many large surface irregularities (amplitude generally more than 1mm). Feels like, or coarser than very coarse sand paper.

COATING TERMS

ABBR	TERM	FIELD GUIDE
CN	Clean	No visible coating
SN	Stained	No visible coating but surfaces are discoloured
VN	Veneer	A visible coating of soil or mineral, too thin to measure; may be patchy
CO	Coating	A visible coating up to 1mm thick. Thicker soil material is usually described using appropriate defect terms (e.g., infilled seam). Thicker rock strength material is usually described as a vein

INFILLING MATERIAL

ABBR	TERM
CA	Calcite
CL	Clay
Fe	Iron Oxide
Fe Clay	Iron Oxide Clay
KT	Chlorite
MS	Secondary Mineral
MU	Unidentified Mineral
Qz	Quartz
X	Carbonaceous
RF	Rock fragments
G	Gravel
S	Sand
Z	Silt

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix G Decontamination and Calibration Records

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Gas Calibration Certificate

Instrument MX6
Serial No. 12102NS-013
Sensors O2,PID,CO2

airmet

Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
	Recharge OK?	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
Pump	Operation		
	Filter		
	Flow		
	Valves, Diaphragm		
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	O2	✓	
	PID	✓	
	CO2	✓	
Alarms	Beeper	✓	
	Settings	✓	
Software	Version		
Datalogger	Operation		
Download	Operation		
Other tests:			

Low	High	TWA	STEL
19.5%	23.5%	N/A	N/A
50ppm	100ppm	10ppm	25ppm
0.5%	1.0%	0.5%	3.0%

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Diffusion mode Aspirated mode

Sensor	Serial no	Calibration gas and concentration	Certified	Gas bottle No	Instrument Reading
O2		20.90%		Fresh Air	20.8%
PID		98ppm	NATA	SY137	97.4ppm
CO2		0.25%	NATA	SY153	0.24%

Calibrated by: Sarah Lian

Calibration date: **16-Apr-18**

Next calibration due: **13-Oct-18**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Multi Parameter Water Meter

Instrument YSI Quatro Pro Plus
Serial No. 17B100729

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 7.00		pH 7.00		307928	pH 6.98
2. pH 4.00		pH 4.00		307927	pH 4.13
3. pH 10.00		pH 10.00		309865	pH 9.61
3. mV		229.6mV		311901/300322	230mV
4. EC		2.76mS		306341	2.73mS
5. D.O		0.00ppm		5253	0.03ppm
6. Temp		22.1°C		MultiTherm	22.6°C

Calibrated by: Sarah Lian

Calibration date: 13/04/2018

Next calibration due: 13/05/2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Multi Parameter Water Meter

Instrument YSI Quatro Pro Plus
Serial No. 10D101443

airmet
Air-Met Scientific Pty Ltd
1300 137 067

Item	Test	Pass	Comments
Battery	Charge Condition	✓	
	Fuses	✓	
	Capacity	✓	
Switch/keypad	Operation	✓	
Display	Intensity	✓	
	Operation (segments)	✓	
Grill Filter	Condition	✓	
	Seal	✓	
PCB	Condition	✓	
Connectors	Condition	✓	
Sensor	1. pH	✓	
	2. mV	✓	
	3. EC	✓	
	4. D.O	✓	
	5. Temp	✓	
Alarms	Beeper		
	Settings		
Software	Version		
Data logger	Operation		
Download	Operation		
Other tests:			

Certificate of Calibration

This is to certify that the above instrument has been calibrated to the following specifications:

Sensor	Serial no	Standard Solutions	Certified	Solution Bottle Number	Instrument Reading
1. pH 10.00		pH 10.00		320322	pH 9.80
2. pH 7.00		pH 7.00		317272	pH 6.99
3. pH 4.00		pH 4.00		320612	pH 4.03
4. mV		234mV		321773/325420	233.9mV
5. EC		2.76mS		320325	2.75mS
6. D.O		0.00ppm		10175	0.04ppm
7. Temp		20.3°C		MultiTherm	20.4°C

Calibrated by: Sarah Lian

Calibration date: 13/11/2018

Next calibration due: 13/12/2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Field Equipment Calibration and Decontamination

PROJECT NAME: Penrith	PROJECT NO: 55073
FIELD DATES: 15·11·18	FIELD STAFF: CB

CALIBRATION SUMMARY	
EQUIPMENT:	PID, IP, Bladder Pump.
CALIBRATION STANDARD:	ISO 100 ppm

PID

DATE	TIME	READING (ppmv)	COMMENTS
15·11·18	11:29	0	Ambient Air Calibration.
	11:30		100 iso
	11:31	100·1	Bump test.

DECONTAMINATION SUMMARY

EQUIPMENT:

IP, bladder Pump

1. Was the equipment decontaminated appropriately prior to sampling at each location?	(Y)	N	NA
2. Was excess soil removed by scraping, brushing or wiping with disposable towels?	(Y)	N	NA
3. Was the equipment contaminated with grease, tar or similar material? If so, was the equipment steam cleaned or rinsed with pesticide-grade acetone:hexane?	Y Y	(N) N	NA
4. Was phosphate-free detergent used to wash the equipment?	(Y)	N	NA
5. Was the equipment rinsed with clean water?	(Y)	N	NA
6. Was the equipment then rinsed with deionised water?	(Y)	N	NA
7. Were all sample containers cleaned and acid or solvent washed prior to sample collection? → lab supplied.	Y	N	(NA)

WERE ANY ADDITIONAL DECONTAMINATION MEASURES REQUIRED? PROVIDE DETAILS.

Fresh gloves used for each sample.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Field Equipment Calibration and Decontamination

55702

PROJECT NAME: Penrith	PROJECT NO: ~~55073~~
FIELD DATES: 15.12.18	FIELD STAFF: CB

CALIBRATION SUMMARY
EQUIPMENT: PID
CALIBRATION STANDARD: 100 150 ppm.

DATE	TIME	READING (ppm$_v$)	COMMENTS
15.12.18	3:30	0	Ambient Air
↓			Bump test
	3.32	100.1	iso 100ppm

DECONTAMINATION SUMMARY

EQUIPMENT:

Drill (hand held)

1. Was the equipment decontaminated appropriately prior to sampling at each location?	(Y)	N	NA
2. Was excess soil removed by scraping, brushing or wiping with disposable towels?	(Y)	N	NA
3. Was the equipment contaminated with grease, tar or similar material? If so, was the equipment steam cleaned or rinsed with pesticide-grade acetone:hexane?	Y Y	(N) N	NA
4. Was phosphate-free detergent used to wash the equipment?	(Y)	N	NA
5. Was the equipment rinsed with clean water?	(Y)	N	NA
6. Was the equipment then rinsed with deionised water?	(Y)	N	NA
7. Were all sample containers cleaned and acid or solvent washed prior to sample collection? No sample containers.	Y	N	(NA)

WERE ANY ADDITIONAL DECONTAMINATION MEASURES REQUIRED? PROVIDE DETAILS.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

TEST DATE AND CONDITIONS	
Date	25-4-18
Atmospheric Pressure	998 mB
Ambient Temp	22.2 °C
Environics Serial No.	3268

GAS DATA LTD
Pegasus House
Seven Stars Estate
Wheler Rd.
Coventry
CV3 4LB
Tel: 024 76 303311 Fax: 024 76 307711

GFM436-1 OUTWARD INSPECTION & QUALITY CHECK SHEET

INSTRUMENT DETAILS					
SO Number	Instrument Banner	Instrument Serial Number + SW Version	Job Number(s)		
319773	GFM436	13071 +27.10	WO14123	—	—

Calibration Technician P.Sen **DATE** 24-4-18

Inspection Technician JSD **DATE** 25-4-18

	INSTRUMENT CHECKS	Pass (P), Fail (F) or not applicable(NA)	INSTRUMENT PACKING LIST		Tick if included
Function Tests	Dust Caps Fitted	P	Instrument		✓
	Keyboard Test (All keys)	P	Leather Case		✓
	Backlight Test	P	Instrument Strap		✓
	Clock Set / Running	P	AC Battery Charger (UK)		X
	Comms Test	P	AC Battery Charger (EURO)		X
	Pump Flow Test (In & Out)	P	AC Battery Charger (US)		X
	Overall Leak Test (30mb)	NA	AC Battery Charger (AUS)		✓
	Battery Charge Test	P	Gas Sample Pipe		✓
	Service Date set to?	24-4-19	Hard Carry Case		✓
Channel Tests	Data Logging Enabled?	P	Spares Pot		✓
	Verify CH4/LEL/Hexane/PID	P	Allen Key		✓
	Verify CO2	P	Flow Sample Pipe		✓
	Verify O2	P	Temperature Probe		X
	Verify H2S	P	Vane Anemometer		X
	Verify CO	P	USB Cable		✓
	Verify LEL	P	USB Memory Stick		✓
	Verify 1st Option gas	NA	SM V5 Software	Ver 6.05	✓
	Verify atmospheric pressure	P	Internal Filter Pack	Qty	X
	Verify differential pressure	P	External Filter Pack	Qty	X
	Verify flow	P	Field Guide		✓
	Verify temperature probe input	P	Extra Items:		
	Verify vane anemometer input	P			
DataBase Checks	Jobcard(s) completed and signed	P			
	Jobcard(s) booked off database	P			
	Calibration certificate completed	P			
	Complete & print QI record	NA			
Label Checks	No. of Calibration label fitted	GDC090889	Comments		
	MCERTS label not displayed	P			
	Warranty label fitted	P			
H2S Range	H2S Range from SO	5000			
	H2S Range from cal cert	5000			
	Over-range value correct?	P			

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

TEST DATE AND CONDITIONS	
Date	24/4/18
Atmospheric Pressure	1001mB
Ambient Temp	24.0°C
Environics Serial No.	3268/2633

GAS DATA LTD
Pegasus House
Seven Stars Estate
Wheler Rd
Coventry
CV3 4LB
Tel 02476303311 Fax 02476307711

GFM436-1 FINAL INSPECTION & CALIBRATION CHECK CERTIFICATE

INSTRUMENT DETAILS	
Serial No	Customer
13071	Anri Instruments and Controls Pty Ltd

INSTRUMENT CHECKS			
Keyboard	✓	Pump Flow	500cc/min
Display Contrast	✓	Pump Flow @ -200mB	300cc/min
Clock Set / Running	✓	S/W Version	G436-00.0027/0010
Labels Fitted	✓	Recalibration Date	24/4/19

GAS CHECKS							
Calibration Gas		Instrument Gas Channels Read					
Gas Type	Applied Conc.	CH4 (%)	tol. (% vol.)	CO2 (%)	tol. (% vol.)	O2 (%)	tol. (% vol.)
N2	100%	0.0	0.0	0.0	0.0	0.0	+/-0.1
CH4	5%	5.1	+/-0.3	0.0	0.0	0.0	+/-0.1
	60%	59.9	+/-3.0	0.0	0.0	0.0	+/-0.1
CO2	5%	0.0	0.0	5.1	+/-0.3	0.0	+/-0.1
	40%	0.0	0.0	39.9	+/-3.0	0.0	+/-0.1
O2	20.9%	0.0	0.0	0.0	+0.1	20.9	+/-0.5

OPTIONAL GAS CHECKS								
Calibration Gas		Instrument Gas Channels Read						
Gas Type	Applied Conc.	Label	H2S	CO			Hexane	tol. (% vol.)
		Range	5000ppm	2000ppm			2.00%	
N2	100%		0	0			0.0	+/- 5.0
H2S	1500ppm		1510	0				+/- 5.0
CO	1000ppm		45	1000				+/- 5.0
Hexane	2.00%						1.996	+/- 10.0

PRESSURE CHECKS							
Calibration Pressure		Instrument Pressure Channels Read					
Pressure @	Applied Pressure	Atmospheric [Ap] (mB)	tol. (mB)				
All Ports	Current Atmospheric	1000	+/-2.0				
Ap Port (Internal)	+800mB(a)	798	+/-5.0				
	+1200mB(a)	1198	+/-5.0				

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

TEST DATE AND CONDITIONS	
Date	24/4/18
Atmospheric Pressure	1001mB
Ambient Temp	24.0°C
Environics Serial No.	3268/2633

GAS DATA LTD
Pegasus House
Seven Stars Estate
Wheler Rd
Coventry
CV3 4LB
Tel 02476303311 Fax 02476307711

GFM436-1 FINAL INSPECTION & CALIBRATION CHECK CERTIFICATE

FLOW CHECKS					
Calibration Flow		Instrument Flow Channels Read			
Applied Flow (l/hour)	Applied Pressure (Pa)	Flow [Flow] (l/hour)	tol. (l/hour)	Differential Pressure [Dp] (Pa)	tol. (Pa)
-30.0	-383	-29.6	+/-3.0	-383	+/-50
-3.0	-17	-3.1	+/-1.0	-18	+/-6
0.0	0	0.0	0.0	0	0.0
+3.0	15	3.0	+/-0.5	15	+/-3
+30.0	317	30.1	+/-3.0	320	+/-50
+60.0	957	60.4	+/-6.0	968	+/-130
+90.0	1904	90.6	+/-9.0	1906	+/-250

TEMPERATURE CHECK		
Calibration Temperature	Instrument Temperature Channel Read	
Applied Equivalent Temperature (°C)	Temperature [Temp] (°C)	tol. (°C)
-10.0	-9.5	+/- 2.0
0.0	0.0	+/- 1.0
30.0	30.0	+/- 1.0
60.0	60.0	+/- 1.0
100.0	100.0	+/- 1.0

Notes:

The instrument identified by the serial number stated above has been tested by Gas Data personnel for calibration accuracy on the date and under the ambient conditions stated. Gas Data Ltd internal BS EN ISO9001:2015 compliant workshop procedures were followed to apply known calibration test gases, gas flow rates, pressures and temperatures of the values stated. The results displayed on the instrument at each stage are recorded above.

Gas Data Ltd is certified to BS EN ISO9001:2015. Certificate NQA 8374. Valid until 22/03/2019

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix H Detailed Laboratory Certificates of Analysis and Chain of Custody Documentation

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

010447

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52372	LABORATORY BATCH NO.:
PROJECT NAME: [illegible]	SAMPLERS: RM
DATE NEEDED BY: STD	QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) RMammadov@jbsg.com.au; (3) .....@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	VOCs	TRHs	PAHs	Lead	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
JBMW01 0.0-0.2	Soil	10-4-18	—	250mL Jar	—							
2.0-2.2												
3.0-3.2												
4.0-4.2												
5.0-5.2						X	X					
6.0-6.2												
7.0-7.2						X	X					
JBMW02 0.4-0.5		9-4-18										
1.4-1.5												
2.0-2.2												
2.5-2.7												
3.0-3.2												
4.0-4.2												
5.0-5.2												
6.0-6.2												
7.0-7.2						X	X					
8.0-8.2						X	X					
JBMW03 0.2-0.3												
1.0-1.2						X	X	X				

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Rchanh DATE: 11-4-18	CONSIGNMENT NOTE NO.	NAME: Elyssa 5:04pm	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 11/4/18	
		OF: Eurofins	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: Chiara Benedetti DATE:	COOLER SEAL – Yes ..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF: 12/04 12:17AM	COOLER TEMP ..... deg C 8.3

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody - Generic

Report: 593556

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

010448

CHAIN OF CUSTODY

JBS&G

PROJECT NO.:	LABORATORY BATCH NO.:
PROJECT NAME:	SAMPLERS:
DATE NEEDED BY:	QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) .....@jbsg.com.au; (3) .....@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	VOCs	TRHs	8 METALS	PAHs	TCLP + MSLP +	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
JBMW03 0.2-0.3	Soil	9-4-18	-	250mL Jar									+ TCLP 8 Metals & PAHs
3.0-3.2													+ ASLP 8 Metals & PAHs
4.0-4.2													
5.0-5.2													
6.0-6.2													
7.0-7.2													
8.0-8.2						X	X						
JBMW04 0.2-0.3		10-4-18				X	X	X	X	X			
1.0-1.2													
2.0-2.2													
3.0-3.2													
4.0-4.2													
4.4-4.5													
6.0-6.2													
7.0-7.2													
8.0-8.2													
RINS	Water			Metals Amber - Plastics		X	X	X	X				
RINS	Water	9-4-18		Amber & 4x vials		X	X						
QA 9-4	Soil	9-4-18				X	X						

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: Elvis	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 11/4/18 5:04pm OF: Eurofins	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: Chiara.B DATE: 12/04 12:17pm OF: EUROFINS	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO		COOLER TEMP ..... deg C 8.3

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody - Generic

Report: 593556

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

010449

CHAIN OF CUSTODY

JBS&G

PROJECT NO.:	LABORATORY BATCH NO.:
PROJECT NAME:	SAMPLERS:
DATE NEEDED BY:	QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) .....@jbsg.com.au; (3) .....@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	BTEX	8 METALS	PAHS	HOLD	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
QA 10-4	Soil	10/4/18	–	250 mL Jar	–		x	x				
TS/TB	Water	–	–	250 mL Jar	✓	x						
ACM-FRAG	Material	10/4/18	–	Cement-Fibre	✓				x			

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Adriana DATE:	CONSIGNMENT NOTE NO.	NAME: Elvis D	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 11/4/18 5:04pm	
		OF: Eurofins	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: Chiara Benedetti DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF: 12/04 12:17Am	COOLER TEMP 8.3 deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody - Generic

Report : 593556

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Rohan Hammond
Project name: PENRITH
Project ID: 52372
COC number: Not provided
Turn around time: 5 Day
Date/Time received: Apr 12, 2018 10:17 AM
Eurofins | mgt reference: **593556**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 8.3 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Rohan Hammond - rhammond@jbsg.com.au.

Note: A copy of these results will also be delivered to the general JBS & G Australia (NSW) P/L email address.

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 593556
Phone: 02 8245 0300
Fax:

Received: Apr 12, 2018 10:17 AM
Due: Apr 19, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Lead	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	JBMW01 5.0-5.2	Apr 10, 2018		Soil	M18-Ap12233							X	X	X
2	JBMW01 7.0-7.2	Apr 10, 2018		Soil	M18-Ap12234							X	X	X
3	JBMW02 7.0-7.2	Apr 09, 2018		Soil	M18-Ap12235							X	X	X
4	JBMW02 8.0-8.2	Apr 09, 2018		Soil	M18-Ap12236							X	X	X
5	JBMW03 1.0-1.2	Apr 09, 2018		Soil	M18-Ap12237		X	X				X	X	X
6	JBMW03 8.0-	Apr 09, 2018		Soil	M18-Ap12238							X	X	X

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

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NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 593556
Phone: 02 8245 0300
Fax:

Received: Apr 12, 2018 10:17 AM
Due: Apr 19, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Lead	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
	8.2													
7	JBMW02 0.8-1.0	Apr 09, 2018		Soil	M18-Ap12239	X								
8	JBMW04 0.2-0.3	Apr 10, 2018		US Leachate	M18-Ap12240			X	X	X				
9	RINS	Apr 10, 2018		Water	M18-Ap12241			X		X		X		X
10	RINS	Apr 09, 2018		Water	M18-Ap12242							X		X
11	QA 9-4	Apr 09, 2018		Soil	M18-Ap12243							X	X	X
12	QA 10-4	Apr 10, 2018		Soil	M18-Ap12244			X		X			X	
13	TS	Apr 11, 2018		Water	M18-Ap12245						X			
14	TB	Apr 11, 2018		Water	M18-Ap12246						X			
15	JBMW01 1.0-1.2	Apr 10, 2018		Soil	M18-Ap12247	X								

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Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 593556
Phone: 02 8245 0300
Fax:

Received: Apr 12, 2018 10:17 AM
Due: Apr 19, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Lead	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
16	JBMW01 2.0-2.2	Apr 10, 2018		Soil	M18-Ap12248	X								
17	JBMW01 3.0-3.2	Apr 10, 2018		Soil	M18-Ap12249	X								
18	JBMW01 4.0-4.2	Apr 10, 2018		Soil	M18-Ap12250	X								
19	JBMW01 6.0-6.2	Apr 10, 2018		Soil	M18-Ap12251	X								
20	JBMW02 0.4-0.5	Apr 09, 2018		Soil	M18-Ap12252	X								
21	JBMW02 1.4-1.5	Apr 09, 2018		Soil	M18-Ap12253	X								
22	JBMW02 2.0-2.7	Apr 09, 2018		Soil	M18-Ap12254	X								

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Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
23	JBMW02 2.5-2.7	Apr 09, 2018		Soil	M18-Ap12255	X								
24	JBMW02 3.0-3.2	Apr 09, 2018		Soil	M18-Ap12256	X								
25	JBMW02 4.0-4.2	Apr 09, 2018		Soil	M18-Ap12257	X								
26	JBMW02 5.0-5.2	Apr 09, 2018		Soil	M18-Ap12258	X								
27	JBMW02 6.0-6.2	Apr 09, 2018		Soil	M18-Ap12259	X								
28	JBMW03 0.2-0.3	Apr 09, 2018		Soil	M18-Ap12260	X								
29	JBMW03 2.0-2.2	Apr 09, 2018		Soil	M18-Ap12261	X								

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
30	JBMW03 3.0-3.2	Apr 09, 2018		Soil	M18-Ap12262	X								
31	JBMW03 4.0-4.2	Apr 09, 2018		Soil	M18-Ap12263	X								
32	JBMW03 5.0-5.2	Apr 09, 2018		Soil	M18-Ap12264	X								
33	JBMW03 6.0-6.2	Apr 09, 2018		Soil	M18-Ap12265	X								
34	JBMW03 7.0-7.2	Apr 09, 2018		Soil	M18-Ap12266	X								
35	JBMW04 1.0-1.2	Apr 10, 2018		Soil	M18-Ap12267	X								
36	JBMW04 2.0-2.2	Apr 10, 2018		Soil	M18-Ap12268	X								

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
37	JBMW04 3.0-3.2	Apr 10, 2018		Soil	M18-Ap12269	X								
38	JBMW04 4.0-4.2	Apr 10, 2018		Soil	M18-Ap12270	X								
39	JBMW04 4.4-4.5	Apr 10, 2018		Soil	M18-Ap12271	X								
40	JBMW04 6.0-6.2	Apr 10, 2018		Soil	M18-Ap12272	X								
41	JBMW04 7.0-7.2	Apr 10, 2018		Soil	M18-Ap12273	X								
42	JBMW04 8.0-8.2	Apr 10, 2018		Soil	M18-Ap12274	X								
43	ACM-FRAG	Apr 10, 2018		Building Materials	M18-Ap12275	X								

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Address:	Level 1, 50 Margaret St Sydney NSW 2000	**Report #:**	593556	**Due:**	Apr 19, 2018
		Phone:	02 8245 0300	**Priority:**	5 Day
		Fax:		**Contact Name:**	Rohan Hammond
Project Name:	PENRITH				
Project ID:	52372				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Lead	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
44	JBMW04 0.2-0.3	Apr 10, 2018		Soil	M18-Ap29342			X		X		X	X	X
Test Counts						30	1	5	1	4	2	10	9	10

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **593556-L-V3**
Project name PENRITH
Project ID 52372
Received Date Apr 12, 2018

Client Sample ID			**JBMW04 0.2-0.3**
Sample Matrix			**US Leachate**
Eurofins | mgt Sample No.			**M18-Ap12240**
Date Sampled			**Apr 10, 2018**
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	58
p-Terphenyl-d14 (surr.)	1	%	76
Heavy Metals			
Arsenic	0.01	mg/L	< 0.01
Cadmium	0.005	mg/L	< 0.005
Chromium	0.01	mg/L	< 0.01
Copper	0.01	mg/L	< 0.01
Lead	0.01	mg/L	< 0.01
Mercury	0.001	mg/L	< 0.001
Nickel	0.01	mg/L	< 0.01
Zinc	0.01	mg/L	0.04
USA Leaching Procedure			
Leachate Fluid[C01]		comment	1.0
pH (initial)	0.1	pH Units	5.7
pH (Leachate fluid)	0.1	pH Units	5.0
pH (off)	0.1	pH Units	6.8
pH (USA HCl addition)	0.1	pH Units	1.6

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Polycyclic Aromatic Hydrocarbons	Melbourne	Apr 16, 2018	7 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	Apr 13, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

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Version: 1, Version Date: 14/04/2021

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Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Lead	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	JBMW01 5.0-5.2	Apr 10, 2018		Soil	M18-Ap12233							X	X	X
2	JBMW01 7.0-7.2	Apr 10, 2018		Soil	M18-Ap12234							X	X	X
3	JBMW02 7.0-7.2	Apr 09, 2018		Soil	M18-Ap12235							X	X	X
4	JBMW02 8.0-8.2	Apr 09, 2018		Soil	M18-Ap12236							X	X	X
5	JBMW03 1.0-1.2	Apr 09, 2018		Soil	M18-Ap12237		X	X				X	X	X
6	JBMW03 8.0-	Apr 09, 2018		Soil	M18-Ap12238							X	X	X

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Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
	8.2													
7	JBMW02 0.8-1.0	Apr 09, 2018		Soil	M18-Ap12239	X								
8	JBMW04 0.2-0.3	Apr 10, 2018		US Leachate	M18-Ap12240			X	X	X				
9	RINS	Apr 10, 2018		Water	M18-Ap12241			X		X		X		X
10	RINS	Apr 09, 2018		Water	M18-Ap12242							X		X
11	QA 9-4	Apr 09, 2018		Soil	M18-Ap12243							X	X	X
12	QA 10-4	Apr 10, 2018		Soil	M18-Ap12244			X		X			X	
13	TS	Apr 11, 2018		Water	M18-Ap12245						X			
14	TB	Apr 11, 2018		Water	M18-Ap12246						X			
15	JBMW01 1.0-1.2	Apr 10, 2018		Soil	M18-Ap12247	X								

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Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
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17	JBMW01 3.0-3.2	Apr 10, 2018		Soil	M18-Ap12249	X								
18	JBMW01 4.0-4.2	Apr 10, 2018		Soil	M18-Ap12250	X								
19	JBMW01 6.0-6.2	Apr 10, 2018		Soil	M18-Ap12251	X								
20	JBMW02 0.4-0.5	Apr 09, 2018		Soil	M18-Ap12252	X								
21	JBMW02 1.4-1.5	Apr 09, 2018		Soil	M18-Ap12253	X								
22	JBMW02 2.0-2.7	Apr 09, 2018		Soil	M18-Ap12254	X								

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Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
23	JBMW02 2.5-2.7	Apr 09, 2018		Soil	M18-Ap12255	X								
24	JBMW02 3.0-3.2	Apr 09, 2018		Soil	M18-Ap12256	X								
25	JBMW02 4.0-4.2	Apr 09, 2018		Soil	M18-Ap12257	X								
26	JBMW02 5.0-5.2	Apr 09, 2018		Soil	M18-Ap12258	X								
27	JBMW02 6.0-6.2	Apr 09, 2018		Soil	M18-Ap12259	X								
28	JBMW03 0.2-0.3	Apr 09, 2018		Soil	M18-Ap12260	X								
29	JBMW03 2.0-2.2	Apr 09, 2018		Soil	M18-Ap12261	X								

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NATA # 1261
Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
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NSW 2000

Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 593556
Phone: 02 8245 0300
Fax:

Received: Apr 12, 2018 10:17 AM
Due: Apr 19, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Lead	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
30	JBMW03 3.0-3.2	Apr 09, 2018		Soil	M18-Ap12262	X								
31	JBMW03 4.0-4.2	Apr 09, 2018		Soil	M18-Ap12263	X								
32	JBMW03 5.0-5.2	Apr 09, 2018		Soil	M18-Ap12264	X								
33	JBMW03 6.0-6.2	Apr 09, 2018		Soil	M18-Ap12265	X								
34	JBMW03 7.0-7.2	Apr 09, 2018		Soil	M18-Ap12266	X								
35	JBMW04 1.0-1.2	Apr 10, 2018		Soil	M18-Ap12267	X								
36	JBMW04 2.0-2.2	Apr 10, 2018		Soil	M18-Ap12268	X								

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
37	JBMW04 3.0-3.2	Apr 10, 2018		Soil	M18-Ap12269	X								
38	JBMW04 4.0-4.2	Apr 10, 2018		Soil	M18-Ap12270	X								
39	JBMW04 4.4-4.5	Apr 10, 2018		Soil	M18-Ap12271	X								
40	JBMW04 6.0-6.2	Apr 10, 2018		Soil	M18-Ap12272	X								
41	JBMW04 7.0-7.2	Apr 10, 2018		Soil	M18-Ap12273	X								
42	JBMW04 8.0-8.2	Apr 10, 2018		Soil	M18-Ap12274	X								
43	ACM-FRAG	Apr 10, 2018		Building Materials	M18-Ap12275	X								

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Sample Detail						HOLD	Lead	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
44	JBMW04 0.2-0.3	Apr 10, 2018		Soil	M18-Ap29342			X		X		X	X	X
Test Counts						30	1	5	1	4	2	10	9	10

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.01			0.01	Pass	
Cadmium	mg/L	< 0.005			0.005	Pass	
Chromium	mg/L	< 0.01			0.01	Pass	
Copper	mg/L	< 0.01			0.01	Pass	
Lead	mg/L	< 0.01			0.01	Pass	
Mercury	mg/L	< 0.001			0.001	Pass	
Nickel	mg/L	< 0.01			0.01	Pass	
Zinc	mg/L	< 0.01			0.01	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Ap20085	NCP	%	91			75-125	Pass	
Cadmium	M18-Ap20085	NCP	%	92			75-125	Pass	
Chromium	M18-Ap20085	NCP	%	90			75-125	Pass	
Copper	M18-Ap20085	NCP	%	91			75-125	Pass	
Lead	M18-Ap20085	NCP	%	93			75-125	Pass	
Mercury	M18-Ap20085	NCP	%	91			70-130	Pass	
Nickel	M18-Ap20085	NCP	%	90			75-125	Pass	
Zinc	M18-Ap20085	NCP	%	95			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ap20085	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Cadmium	M18-Ap20085	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Chromium	M18-Ap20085	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Copper	M18-Ap20085	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Lead	M18-Ap20085	NCP	mg/L	0.03	0.03	1.0	30%	Pass	
Mercury	M18-Ap20085	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Nickel	M18-Ap20085	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Zinc	M18-Ap20085	NCP	mg/L	0.09	0.10	5.0	30%	Pass	

Comments

This report has been revised (V3) to include test results for sample M18-Ap29342 and to remove the results from sample M18-Ap12239.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Celebrating 30 years Testing and Protecting Human Health

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **593556-S-V3**
Project name PENRITH
Project ID 52372
Received Date Apr 12, 2018

Client Sample ID			**JBMW01 5.0-5.2**	**JBMW01 7.0-7.2**	**JBMW02 7.0-7.2**	**JBMW02 8.0-8.2**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Ap12233**	**M18-Ap12234**	**M18-Ap12235**	**M18-Ap12236**
Date Sampled			**Apr 10, 2018**	**Apr 10, 2018**	**Apr 09, 2018**	**Apr 09, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Butanone (MEK)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Allyl chloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Bromobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Bromomethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Carbon disulfide	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

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Version: 1, Version Date: 14/04/2021

Client Sample ID			JBMW01 5.0-5.2	JBMW01 7.0-7.2	JBMW02 7.0-7.2	JBMW02 8.0-8.2
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Ap12233**	**M18-Ap12234**	**M18-Ap12235**	**M18-Ap12236**
Date Sampled			**Apr 10, 2018**	**Apr 10, 2018**	**Apr 09, 2018**	**Apr 09, 2018**
Test/Reference	LOR	Unit				
Volatile Organics						
Chlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Iodomethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Styrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
Total MAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Bromofluorobenzene (surr.)	1	%	102	114	115	109
Toluene-d8 (surr.)	1	%	72	88	88	84
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
% Moisture	1	%	16	7.1	19	9.7

Client Sample ID			JBMW03 1.0-1.2	JBMW03 8.0-8.2	QA 9-4	QA 10-4
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Ap12237**	**M18-Ap12238**	**M18-Ap12243**	**M18-Ap12244**
Date Sampled			**Apr 09, 2018**	**Apr 09, 2018**	**Apr 09, 2018**	**Apr 10, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	-
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	-
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	-
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	-
TRH C10-36 (Total)	50	mg/kg	< 50	< 50	< 50	-
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.1-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.2-Dibromoethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.2-Dichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.2-Dichloropropane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.3-Dichloropropane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2-Butanone (MEK)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
2-Propanone (Acetone)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
4-Chlorotoluene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Allyl chloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Bromobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Bromochloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Bromodichloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Bromoform	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Bromomethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Carbon disulfide	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Carbon Tetrachloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chloroform	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Chloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dibromochloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dibromomethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Dichlorodifluoromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Iodomethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	-
Methylene Chloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-

Client Sample ID			JBMW03 1.0-1.2	JBMW03 8.0-8.2	QA 9-4	QA 10-4
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins | mgt Sample No.			M18-Ap12237	M18-Ap12238	M18-Ap12243	M18-Ap12244
Date Sampled			Apr 09, 2018	Apr 09, 2018	Apr 09, 2018	Apr 10, 2018
Test/Reference	LOR	Unit				
Volatile Organics						
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
Styrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Tetrachloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	-
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Trichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Trichlorofluoromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Vinyl chloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Xylenes - Total	0.3	mg/kg	< 0.3	< 0.3	< 0.3	-
Total MAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
4-Bromofluorobenzene (surr.)	1	%	112	114	110	-
Toluene-d8 (surr.)	1	%	88	87	85	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	-
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	-
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	-
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	-
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	-
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	-
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	-
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-	1.2
Acenaphthene	0.5	mg/kg	< 0.5	-	-	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5	-	-	< 0.5
Anthracene	0.5	mg/kg	< 0.5	-	-	< 0.5
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	-	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-	< 0.5
Chrysene	0.5	mg/kg	< 0.5	-	-	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-	< 0.5
Fluoranthene	0.5	mg/kg	< 0.5	-	-	< 0.5
Fluorene	0.5	mg/kg	< 0.5	-	-	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	-	< 0.5
Naphthalene	0.5	mg/kg	< 0.5	-	-	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5	-	-	< 0.5
Pyrene	0.5	mg/kg	< 0.5	-	-	< 0.5
Total PAH*	0.5	mg/kg	< 0.5	-	-	< 0.5
2-Fluorobiphenyl (surr.)	1	%	86	-	-	92
p-Terphenyl-d14 (surr.)	1	%	100	-	-	100

Client Sample ID			JBMW03 1.0-1.2	JBMW03 8.0-8.2	QA 9-4	QA 10-4
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-Ap12237**	**M18-Ap12238**	**M18-Ap12243**	**M18-Ap12244**
Date Sampled			**Apr 09, 2018**	**Apr 09, 2018**	**Apr 09, 2018**	**Apr 10, 2018**
Test/Reference	LOR	Unit				
Heavy Metals						
Arsenic	2	mg/kg	-	-	-	4.9
Cadmium	0.4	mg/kg	-	-	-	1.8
Chromium	5	mg/kg	-	-	-	21
Copper	5	mg/kg	-	-	-	58
Lead	5	mg/kg	15	-	-	200
Mercury	0.1	mg/kg	-	-	-	1.3
Nickel	5	mg/kg	-	-	-	32
Zinc	5	mg/kg	-	-	-	470
% Moisture	1	%	21	14	19	10

Client Sample ID			JBMW04 0.2-0.3
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**M18-Ap29342**
Date Sampled			**Apr 10, 2018**
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-36 (Total)	50	mg/kg	< 50
Volatile Organics			
1.1-Dichloroethane	0.5	mg/kg	< 0.5
1.1-Dichloroethene	0.5	mg/kg	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5
1.2-Dibromoethane	0.5	mg/kg	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5
1.2-Dichloroethane	0.5	mg/kg	< 0.5
1.2-Dichloropropane	0.5	mg/kg	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5
1.3-Dichloropropane	0.5	mg/kg	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5
2-Butanone (MEK)	0.5	mg/kg	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	< 0.5
4-Chlorotoluene	0.5	mg/kg	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5
Allyl chloride	0.5	mg/kg	< 0.5
Benzene	0.1	mg/kg	< 0.1
Bromobenzene	0.5	mg/kg	< 0.5
Bromochloromethane	0.5	mg/kg	< 0.5

Client Sample ID			JBMW04 0.2-0.3
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**M18-Ap29342**
Date Sampled			**Apr 10, 2018**
Test/Reference	LOR	Unit	
Volatile Organics			
Bromodichloromethane	0.5	mg/kg	< 0.5
Bromoform	0.5	mg/kg	< 0.5
Bromomethane	0.5	mg/kg	< 0.5
Carbon disulfide	0.5	mg/kg	< 0.5
Carbon Tetrachloride	0.5	mg/kg	< 0.5
Chlorobenzene	0.5	mg/kg	< 0.5
Chloroethane	0.5	mg/kg	< 0.5
Chloroform	0.5	mg/kg	< 0.5
Chloromethane	0.5	mg/kg	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5
Dibromochloromethane	0.5	mg/kg	< 0.5
Dibromomethane	0.5	mg/kg	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	< 0.5
Ethylbenzene	0.1	mg/kg	< 0.1
Iodomethane	0.5	mg/kg	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5
m&p-Xylenes	0.2	mg/kg	< 0.2
Methylene Chloride	0.5	mg/kg	< 0.5
o-Xylene	0.1	mg/kg	< 0.1
Styrene	0.5	mg/kg	< 0.5
Tetrachloroethene	0.5	mg/kg	< 0.5
Toluene	0.1	mg/kg	< 0.1
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5
Trichloroethene	0.5	mg/kg	< 0.5
Trichlorofluoromethane	0.5	mg/kg	< 0.5
Vinyl chloride	0.5	mg/kg	< 0.5
Xylenes - Total	0.3	mg/kg	< 0.3
Total MAH*	0.5	mg/kg	< 0.5
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	< 0.5
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	< 0.5
4-Bromofluorobenzene (surr.)	1	%	100
Toluene-d8 (surr.)	1	%	96
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
Polycyclic Aromatic Hydrocarbons			
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2
Acenaphthene	0.5	mg/kg	< 0.5
Acenaphthylene	0.5	mg/kg	< 0.5
Anthracene	0.5	mg/kg	< 0.5

Client Sample ID			JBMW04 0.2-0.3
Sample Matrix			**Soil**
Eurofins | mgt Sample No.			**M18-Ap29342**
Date Sampled			**Apr 10, 2018**
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Benz(a)anthracene	0.5	mg/kg	< 0.5
Benzo(a)pyrene	0.5	mg/kg	< 0.5
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5
Chrysene	0.5	mg/kg	< 0.5
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5
Fluoranthene	0.5	mg/kg	0.7
Fluorene	0.5	mg/kg	< 0.5
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5
Naphthalene	0.5	mg/kg	< 0.5
Phenanthrene	0.5	mg/kg	< 0.5
Pyrene	0.5	mg/kg	0.7
Total PAH*	0.5	mg/kg	1.4
2-Fluorobiphenyl (surr.)	1	%	61
p-Terphenyl-d14 (surr.)	1	%	56
Heavy Metals			
Arsenic	2	mg/kg	7.4
Cadmium	0.4	mg/kg	0.6
Chromium	5	mg/kg	15
Copper	5	mg/kg	42
Lead	5	mg/kg	210
Mercury	0.1	mg/kg	0.2
Nickel	5	mg/kg	13
Zinc	5	mg/kg	370
% Moisture	1	%	12

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Apr 26, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C36			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 26, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 26, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Volatile Organics	Melbourne	Apr 26, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Polycyclic Aromatic Hydrocarbons	Melbourne	Apr 26, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	Apr 26, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Heavy Metals	Melbourne	Apr 13, 2018	180 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
% Moisture	Melbourne	Apr 26, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Company Name: JBS & G Australia (NSW) P/L
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Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 593556
Phone: 02 8245 0300
Fax:

Received: Apr 12, 2018 10:17 AM
Due: Apr 19, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Lead	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	JBMW01 5.0-5.2	Apr 10, 2018		Soil	M18-Ap12233							X	X	X
2	JBMW01 7.0-7.2	Apr 10, 2018		Soil	M18-Ap12234							X	X	X
3	JBMW02 7.0-7.2	Apr 09, 2018		Soil	M18-Ap12235							X	X	X
4	JBMW02 8.0-8.2	Apr 09, 2018		Soil	M18-Ap12236							X	X	X
5	JBMW03 1.0-1.2	Apr 09, 2018		Soil	M18-Ap12237		X	X				X	X	X
6	JBMW03 8.0-	Apr 09, 2018		Soil	M18-Ap12238							X	X	X

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Version: 1, Version Date: 14/04/2021

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NSW 2000

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Phone: 02 8245 0300
Fax:

Received: Apr 12, 2018 10:17 AM
Due: Apr 19, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Lead	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
	8.2													
7	JBMW02 0.8-1.0	Apr 09, 2018		Soil	M18-Ap12239	X								
8	JBMW04 0.2-0.3	Apr 10, 2018		US Leachate	M18-Ap12240			X	X	X				
9	RINS	Apr 10, 2018		Water	M18-Ap12241			X		X		X		X
10	RINS	Apr 09, 2018		Water	M18-Ap12242							X		X
11	QA 9-4	Apr 09, 2018		Soil	M18-Ap12243							X	X	X
12	QA 10-4	Apr 10, 2018		Soil	M18-Ap12244			X		X			X	
13	TS	Apr 11, 2018		Water	M18-Ap12245						X			
14	TB	Apr 11, 2018		Water	M18-Ap12246						X			
15	JBMW01 1.0-1.2	Apr 10, 2018		Soil	M18-Ap12247	X								

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Fax:

Received: Apr 12, 2018 10:17 AM
Due: Apr 19, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Lead	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
16	JBMW01 2.0-2.2	Apr 10, 2018		Soil	M18-Ap12248	X								
17	JBMW01 3.0-3.2	Apr 10, 2018		Soil	M18-Ap12249	X								
18	JBMW01 4.0-4.2	Apr 10, 2018		Soil	M18-Ap12250	X								
19	JBMW01 6.0-6.2	Apr 10, 2018		Soil	M18-Ap12251	X								
20	JBMW02 0.4-0.5	Apr 09, 2018		Soil	M18-Ap12252	X								
21	JBMW02 1.4-1.5	Apr 09, 2018		Soil	M18-Ap12253	X								
22	JBMW02 2.0-2.7	Apr 09, 2018		Soil	M18-Ap12254	X								

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NATA # 1261
Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 52372

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Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
23	JBMW02 2.5-2.7	Apr 09, 2018		Soil	M18-Ap12255	X								
24	JBMW02 3.0-3.2	Apr 09, 2018		Soil	M18-Ap12256	X								
25	JBMW02 4.0-4.2	Apr 09, 2018		Soil	M18-Ap12257	X								
26	JBMW02 5.0-5.2	Apr 09, 2018		Soil	M18-Ap12258	X								
27	JBMW02 6.0-6.2	Apr 09, 2018		Soil	M18-Ap12259	X								
28	JBMW03 0.2-0.3	Apr 09, 2018		Soil	M18-Ap12260	X								
29	JBMW03 2.0-2.2	Apr 09, 2018		Soil	M18-Ap12261	X								

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
30	JBMW03 3.0-3.2	Apr 09, 2018		Soil	M18-Ap12262	X								
31	JBMW03 4.0-4.2	Apr 09, 2018		Soil	M18-Ap12263	X								
32	JBMW03 5.0-5.2	Apr 09, 2018		Soil	M18-Ap12264	X								
33	JBMW03 6.0-6.2	Apr 09, 2018		Soil	M18-Ap12265	X								
34	JBMW03 7.0-7.2	Apr 09, 2018		Soil	M18-Ap12266	X								
35	JBMW04 1.0-1.2	Apr 10, 2018		Soil	M18-Ap12267	X								
36	JBMW04 2.0-2.2	Apr 10, 2018		Soil	M18-Ap12268	X								

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
37	JBMW04 3.0-3.2	Apr 10, 2018		Soil	M18-Ap12269	X								
38	JBMW04 4.0-4.2	Apr 10, 2018		Soil	M18-Ap12270	X								
39	JBMW04 4.4-4.5	Apr 10, 2018		Soil	M18-Ap12271	X								
40	JBMW04 6.0-6.2	Apr 10, 2018		Soil	M18-Ap12272	X								
41	JBMW04 7.0-7.2	Apr 10, 2018		Soil	M18-Ap12273	X								
42	JBMW04 8.0-8.2	Apr 10, 2018		Soil	M18-Ap12274	X								
43	ACM-FRAG	Apr 10, 2018		Building Materials	M18-Ap12275	X								

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Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Lead	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
44	JBMW04 0.2-0.3	Apr 10, 2018		Soil	M18-Ap29342			X		X		X	X	X
Test Counts						30	1	5	1	4	2	10	9	10

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dibromoethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
2-Butanone (MEK)	mg/kg	< 0.5			0.5	Pass	
2-Propanone (Acetone)	mg/kg	< 0.5			0.5	Pass	
4-Chlorotoluene	mg/kg	< 0.5			0.5	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.5			0.5	Pass	
Allyl chloride	mg/kg	< 0.5			0.5	Pass	
Benzene	mg/kg	< 0.1			0.1	Pass	
Bromobenzene	mg/kg	< 0.5			0.5	Pass	
Bromochloromethane	mg/kg	< 0.5			0.5	Pass	
Bromodichloromethane	mg/kg	< 0.5			0.5	Pass	
Bromoform	mg/kg	< 0.5			0.5	Pass	
Bromomethane	mg/kg	< 0.5			0.5	Pass	
Carbon disulfide	mg/kg	< 0.5			0.5	Pass	
Carbon Tetrachloride	mg/kg	< 0.5			0.5	Pass	
Chlorobenzene	mg/kg	< 0.5			0.5	Pass	
Chloroethane	mg/kg	< 0.5			0.5	Pass	
Chloroform	mg/kg	< 0.5			0.5	Pass	
Chloromethane	mg/kg	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Dibromochloromethane	mg/kg	< 0.5			0.5	Pass	
Dibromomethane	mg/kg	< 0.5			0.5	Pass	
Dichlorodifluoromethane	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
Iodomethane	mg/kg	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	mg/kg	< 0.5			0.5	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
Methylene Chloride	mg/kg	< 0.5			0.5	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Styrene	mg/kg	< 0.5			0.5	Pass	
Tetrachloroethene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
trans-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Trichloroethene	mg/kg	< 0.5			0.5	Pass	
Trichlorofluoromethane	mg/kg	< 0.5			0.5	Pass	
Vinyl chloride	mg/kg	< 0.5			0.5	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	102			70-130	Pass	
TRH C10-C14	%	90			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	78			70-130	Pass	
1.1.1-Trichloroethane	%	100			70-130	Pass	
1.2-Dichlorobenzene	%	115			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.2-Dichloroethane	%	124			70-130	Pass	
Benzene	%	93			70-130	Pass	
Ethylbenzene	%	114			70-130	Pass	
m&p-Xylenes	%	121			70-130	Pass	
Toluene	%	106			70-130	Pass	
Trichloroethene	%	107			70-130	Pass	
Xylenes - Total	%	118			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	108			70-130	Pass	
TRH C6-C10	%	97			70-130	Pass	
TRH >C10-C16	%	79			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	82			70-130	Pass	
Acenaphthylene	%	93			70-130	Pass	
Anthracene	%	98			70-130	Pass	
Benz(a)anthracene	%	83			70-130	Pass	
Benzo(a)pyrene	%	87			70-130	Pass	
Benzo(b&j)fluoranthene	%	98			70-130	Pass	
Benzo(g.h.i)perylene	%	80			70-130	Pass	
Benzo(k)fluoranthene	%	77			70-130	Pass	
Chrysene	%	96			70-130	Pass	
Dibenz(a.h)anthracene	%	90			70-130	Pass	
Fluoranthene	%	85			70-130	Pass	
Fluorene	%	93			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	87			70-130	Pass	
Naphthalene	%	97			70-130	Pass	
Phenanthrene	%	96			70-130	Pass	
Pyrene	%	85			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	107			80-120	Pass	
Cadmium	%	103			80-120	Pass	
Chromium	%	110			80-120	Pass	
Copper	%	103			80-120	Pass	
Lead	%	118			80-120	Pass	
Lead	%	106			80-120	Pass	
Mercury	%	86			75-125	Pass	
Nickel	%	103			80-120	Pass	
Zinc	%	107			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	M18-Ap12234	CP	%	83			70-130	Pass	
TRH C10-C14	M18-Ap12234	CP	%	128			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethene	M18-Ap12234	CP	%	83			70-130	Pass	
1.1.1-Trichloroethane	M18-Ap12234	CP	%	93			70-130	Pass	
1.2-Dichlorobenzene	M18-Ap12234	CP	%	91			70-130	Pass	
1.2-Dichloroethane	M18-Ap12234	CP	%	113			70-130	Pass	
Benzene	M18-Ap12234	CP	%	107			70-130	Pass	
Ethylbenzene	M18-Ap12234	CP	%	84			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
m&p-Xylenes	M18-Ap12234	CP	%	87			70-130	Pass	
o-Xylene	M18-Ap12234	CP	%	88			70-130	Pass	
Toluene	M18-Ap12234	CP	%	109			70-130	Pass	
Trichloroethene	M18-Ap12234	CP	%	97			70-130	Pass	
Xylenes - Total	M18-Ap12234	CP	%	88			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-Ap12234	CP	%	81			70-130	Pass	
TRH C6-C10	M18-Ap12234	CP	%	78			70-130	Pass	
TRH >C10-C16	M18-Ap12234	CP	%	109			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Lead	M18-Ap11455	NCP	%	120			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Ap12239	CP	%	82			70-130	Pass	
Acenaphthylene	M18-Ap12239	CP	%	93			70-130	Pass	
Anthracene	M18-Ap12239	CP	%	90			70-130	Pass	
Benz(a)anthracene	M18-Ap12239	CP	%	89			70-130	Pass	
Benzo(a)pyrene	M18-Ap12239	CP	%	88			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Ap12239	CP	%	91			70-130	Pass	
Benzo(g.h.i)perylene	M18-Ap12239	CP	%	81			70-130	Pass	
Benzo(k)fluoranthene	M18-Ap12239	CP	%	105			70-130	Pass	
Chrysene	M18-Ap12239	CP	%	94			70-130	Pass	
Dibenz(a.h)anthracene	M18-Ap12239	CP	%	91			70-130	Pass	
Fluoranthene	M18-Ap12239	CP	%	87			70-130	Pass	
Fluorene	M18-Ap12239	CP	%	93			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ap12239	CP	%	88			70-130	Pass	
Naphthalene	M18-Ap12239	CP	%	94			70-130	Pass	
Phenanthrene	M18-Ap12239	CP	%	99			70-130	Pass	
Pyrene	M18-Ap12239	CP	%	88			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-Ap29002	NCP	%	94			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Ap29002	NCP	%	85			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	M18-Ap29002	NCP	%	87			70-130	Pass	
Acenaphthylene	M18-Ap29002	NCP	%	89			70-130	Pass	
Anthracene	M18-Ap29002	NCP	%	85			70-130	Pass	
Benz(a)anthracene	M18-Ap29002	NCP	%	81			70-130	Pass	
Benzo(a)pyrene	M18-Ap29002	NCP	%	98			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Ap29002	NCP	%	96			70-130	Pass	
Benzo(g.h.i)perylene	M18-Ap29002	NCP	%	97			70-130	Pass	
Benzo(k)fluoranthene	M18-Ap29002	NCP	%	87			70-130	Pass	
Chrysene	M18-Ap29002	NCP	%	106			70-130	Pass	
Dibenz(a.h)anthracene	M18-Ap29002	NCP	%	117			70-130	Pass	
Fluoranthene	M18-Ap29002	NCP	%	77			70-130	Pass	
Fluorene	M18-Ap29002	NCP	%	90			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ap29002	NCP	%	103			70-130	Pass	
Naphthalene	M18-Ap29002	NCP	%	83			70-130	Pass	
Phenanthrene	M18-Ap29002	NCP	%	79			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Pyrene	M18-Ap29002	NCP	%	81			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S18-Ap24747	NCP	%	101			75-125	Pass	
Cadmium	S18-Ap24747	NCP	%	97			75-125	Pass	
Chromium	S18-Ap24747	NCP	%	105			75-125	Pass	
Copper	S18-Ap24747	NCP	%	102			75-125	Pass	
Lead	S18-Ap24747	NCP	%	112			75-125	Pass	
Mercury	S18-Ap24747	NCP	%	86			70-130	Pass	
Nickel	S18-Ap24747	NCP	%	98			75-125	Pass	
Zinc	S18-Ap24747	NCP	%	132			75-125	Fail	Q08
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Ap12233	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M18-Ap12233	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-Ap12233	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M18-Ap12233	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1-Dichloroethene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1-Trichloroethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2-Trichloroethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dibromoethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichlorobenzene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloroethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloropropane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3-Trichloropropane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trimethylbenzene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichlorobenzene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichloropropane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3.5-Trimethylbenzene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.4-Dichlorobenzene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Butanone (MEK)	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Propanone (Acetone)	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chlorotoluene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Allyl chloride	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzene	M18-Ap12233	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Bromobenzene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromochloromethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromodichloromethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromoform	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromomethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon disulfide	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon Tetrachloride	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chlorobenzene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroform	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloromethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.2-Dichloroethene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
cis-1.3-Dichloropropene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromochloromethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromomethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorodifluoromethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Ethylbenzene	M18-Ap12233	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Iodomethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Isopropyl benzene (Cumene)	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
m&p-Xylenes	M18-Ap12233	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methylene Chloride	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
o-Xylene	M18-Ap12233	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Styrene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Tetrachloroethene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Toluene	M18-Ap12233	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
trans-1.2-Dichloroethene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.3-Dichloropropene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichloroethene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichlorofluoromethane	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Vinyl chloride	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Xylenes - Total	M18-Ap12233	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Ap12233	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-Ap12233	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M18-Ap12233	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M18-Ap12233	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M18-Ap12233	CP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Ap12233	CP	%	16	17	1.0	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Ap12237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M18-Ap12237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M18-Ap12237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M18-Ap12237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M18-Ap12237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Ap12237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Ap12237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Ap12237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M18-Ap12237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Ap12237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M18-Ap12237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M18-Ap12237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ap12237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M18-Ap12237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M18-Ap12237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M18-Ap12237	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	M18-Ap11901	NCP	mg/kg	460	470	2.0	30%	Pass	

Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-Ap29342	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M18-Ap26974	NCP	mg/kg	130	130	5.0	30%	Pass	
TRH C15-C28	M18-Ap26974	NCP	mg/kg	260	260	3.0	30%	Pass	
TRH C29-C36	M18-Ap26974	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1-Dichloroethene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1-Trichloroethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2-Trichloroethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dibromoethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichlorobenzene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloroethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloropropane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3-Trichloropropane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trimethylbenzene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichlorobenzene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichloropropane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3.5-Trimethylbenzene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.4-Dichlorobenzene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Butanone (MEK)	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Propanone (Acetone)	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chlorotoluene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Allyl chloride	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzene	M18-Ap29342	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Bromobenzene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromochloromethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromodichloromethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromoform	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromomethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon disulfide	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon Tetrachloride	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chlorobenzene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroform	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloromethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.2-Dichloroethene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.3-Dichloropropene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromochloromethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromomethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorodifluoromethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Ethylbenzene	M18-Ap29342	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Iodomethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Isopropyl benzene (Cumene)	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
m&p-Xylenes	M18-Ap29342	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methylene Chloride	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
o-Xylene	M18-Ap29342	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Styrene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Tetrachloroethene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Toluene	M18-Ap29342	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
trans-1.2-Dichloroethene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
trans-1.3-Dichloropropene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichloroethene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichlorofluoromethane	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Vinyl chloride	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Xylenes - Total	M18-Ap29342	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-Ap29342	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-Ap29342	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M18-Ap26974	NCP	mg/kg	200	200	2.0	30%	Pass	
TRH >C16-C34	M18-Ap26974	NCP	mg/kg	160	170	6.0	30%	Pass	
TRH >C34-C40	M18-Ap26974	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Ap28991	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	M18-Ap28991	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	M18-Ap28991	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	M18-Ap28991	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	M18-Ap28991	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Ap28991	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Ap28991	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Ap28991	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	M18-Ap28991	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Ap28991	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	M18-Ap28991	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	M18-Ap28991	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ap28991	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	M18-Ap28991	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	M18-Ap28991	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	M18-Ap28991	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ap27146	NCP	mg/kg	< 2	< 2	<1	30%	Pass	
Cadmium	M18-Ap27146	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	M18-Ap27146	NCP	mg/kg	14	16	14	30%	Pass	
Copper	M18-Ap27146	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Lead	M18-Ap27146	NCP	mg/kg	8.7	11	19	30%	Pass	
Mercury	M18-Ap27146	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	M18-Ap27146	NCP	mg/kg	< 5	< 5	<1	30%	Pass	
Zinc	M18-Ap27146	NCP	mg/kg	< 5	5.0	37	30%	Fail	Q15
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-Ap29327	NCP	%	19	19	1.0	30%	Pass	

Comments

This report has been revised (V3) to include test results for sample M18-Ap29342 and to remove the results from sample M18-Ap12239.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

eurofins | mgt

30 years Testing For Life 1987–2017
Celebrating 30 years Testing and Protecting Human Health

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **593556-W-V3**
Project name PENRITH
Project ID 52372
Received Date Apr 12, 2018

Client Sample ID			**RINS**	**RINS**	**TS**	**TB**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M18-Ap12241**	**M18-Ap12242**	**M18-Ap12245**	**M18-Ap12246**
Date Sampled			**Apr 10, 2018**	**Apr 09, 2018**	**Apr 11, 2018**	**Apr 11, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	< 0.02	< 0.02	-	-
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	-	-
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	-	-
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	-	-
TRH C10-36 (Total)	0.1	mg/L	< 0.1	< 0.1	-	-
BTEX						
Comments					R20	
Benzene	0.001	mg/L	-	-	91	< 0.001
Toluene	0.001	mg/L	-	-	90	< 0.001
Ethylbenzene	0.001	mg/L	-	-	93	< 0.001
m&p-Xylenes	0.002	mg/L	-	-	91	< 0.002
o-Xylene	0.001	mg/L	-	-	90	< 0.001
Xylenes - Total	0.003	mg/L	-	-	91	< 0.003
4-Bromofluorobenzene (surr.)	1	%	-	-	105	76
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	-	-
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	-	-
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	-	-
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	-	-
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	-	-
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	-	-
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	-	-
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	-	-
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	-	-
2-Butanone (MEK)	0.001	mg/L	< 0.001	< 0.001	-	-
2-Propanone (Acetone)	0.001	mg/L	< 0.001	< 0.005	-	-
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	-	-
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	< 0.001	-	-

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Client Sample ID			RINS	RINS	TS	TB
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M18-Ap12241**	**M18-Ap12242**	**M18-Ap12245**	**M18-Ap12246**
Date Sampled			**Apr 10, 2018**	**Apr 09, 2018**	**Apr 11, 2018**	**Apr 11, 2018**
Test/Reference	LOR	Unit				
Volatile Organics						
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	-	-
Benzene	0.001	mg/L	< 0.001	< 0.001	-	-
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	-	-
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	-	-
Bromodichloromethane	0.001	mg/L	< 0.001	< 0.001	-	-
Bromoform	0.001	mg/L	< 0.001	< 0.001	-	-
Bromomethane	0.001	mg/L	< 0.001	< 0.001	-	-
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	-	-
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	-	-
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	-	-
Chloroethane	0.001	mg/L	< 0.001	< 0.001	-	-
Chloroform	0.005	mg/L	< 0.005	< 0.005	-	-
Chloromethane	0.001	mg/L	< 0.001	< 0.001	-	-
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	-	-
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	-	-
Dibromochloromethane	0.001	mg/L	< 0.001	< 0.001	-	-
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	-	-
Dichlorodifluoromethane	0.001	mg/L	< 0.001	< 0.001	-	-
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	-	-
Iodomethane	0.001	mg/L	< 0.001	< 0.001	-	-
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	-	-
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	-	-
Methylene Chloride	0.001	mg/L	< 0.001	< 0.001	-	-
o-Xylene	0.001	mg/L	< 0.001	< 0.001	-	-
Styrene	0.001	mg/L	< 0.001	0.001	-	-
Tetrachloroethene	0.001	mg/L	< 0.001	< 0.001	-	-
Toluene	0.001	mg/L	< 0.001	< 0.001	-	-
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	-	-
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	-	-
Trichloroethene	0.001	mg/L	< 0.001	< 0.001	-	-
Trichlorofluoromethane	0.001	mg/L	< 0.001	< 0.001	-	-
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	-	-
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	-	-
Total MAH*	0.003	mg/L	< 0.003	< 0.003	-	-
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	-	-
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	-	-
4-Bromofluorobenzene (surr.)	1	%	104	106	-	-
Toluene-d8 (surr.)	1	%	91	93	-	-
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	-	-
TRH C6-C10	0.02	mg/L	< 0.02	< 0.02	-	-
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	< 0.02	< 0.02	-	-
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	-	-
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	< 0.05	-	-
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	-	-
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	-	-

Client Sample ID			RINS	RINS	TS	TB
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M18-Ap12241**	**M18-Ap12242**	**M18-Ap12245**	**M18-Ap12246**
Date Sampled			**Apr 10, 2018**	**Apr 09, 2018**	**Apr 11, 2018**	**Apr 11, 2018**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	< 0.001	-	-	-
Acenaphthylene	0.001	mg/L	< 0.001	-	-	-
Anthracene	0.001	mg/L	< 0.001	-	-	-
Benz(a)anthracene	0.001	mg/L	< 0.001	-	-	-
Benzo(a)pyrene	0.001	mg/L	< 0.001	-	-	-
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001	-	-	-
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001	-	-	-
Benzo(k)fluoranthene	0.001	mg/L	< 0.001	-	-	-
Chrysene	0.001	mg/L	< 0.001	-	-	-
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001	-	-	-
Fluoranthene	0.001	mg/L	< 0.001	-	-	-
Fluorene	0.001	mg/L	< 0.001	-	-	-
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001	-	-	-
Naphthalene	0.001	mg/L	< 0.001	-	-	-
Phenanthrene	0.001	mg/L	< 0.001	-	-	-
Pyrene	0.001	mg/L	< 0.001	-	-	-
Total PAH*	0.001	mg/L	< 0.001	-	-	-
2-Fluorobiphenyl (surr.)	1	%	76	-	-	-
p-Terphenyl-d14 (surr.)	1	%	91	-	-	-
Heavy Metals						
Arsenic	0.001	mg/L	< 0.001	-	-	-
Cadmium	0.0002	mg/L	< 0.0002	-	-	-
Chromium	0.001	mg/L	< 0.001	-	-	-
Copper	0.001	mg/L	< 0.001	-	-	-
Lead	0.001	mg/L	< 0.001	-	-	-
Mercury	0.0001	mg/L	< 0.0001	-	-	-
Nickel	0.001	mg/L	< 0.001	-	-	-
Zinc	0.005	mg/L	< 0.005	-	-	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Apr 16, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C36			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 13, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 16, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
BTEX	Melbourne	Apr 13, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Volatile Organics	Melbourne	Apr 13, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Polycyclic Aromatic Hydrocarbons	Melbourne	Apr 16, 2018	7 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	Apr 13, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

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Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 593556
Phone: 02 8245 0300
Fax:

Received: Apr 12, 2018 10:17 AM
Due: Apr 19, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Lead	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	JBMW01 5.0-5.2	Apr 10, 2018		Soil	M18-Ap12233							X	X	X
2	JBMW01 7.0-7.2	Apr 10, 2018		Soil	M18-Ap12234							X	X	X
3	JBMW02 7.0-7.2	Apr 09, 2018		Soil	M18-Ap12235							X	X	X
4	JBMW02 8.0-8.2	Apr 09, 2018		Soil	M18-Ap12236							X	X	X
5	JBMW03 1.0-1.2	Apr 09, 2018		Soil	M18-Ap12237		X	X				X	X	X
6	JBMW03 8.0-	Apr 09, 2018		Soil	M18-Ap12238							X	X	X

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Sample Detail						HOLD	Lead	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
	8.2													
7	JBMW02 0.8-1.0	Apr 09, 2018		Soil	M18-Ap12239	X								
8	JBMW04 0.2-0.3	Apr 10, 2018		US Leachate	M18-Ap12240			X	X	X				
9	RINS	Apr 10, 2018		Water	M18-Ap12241			X		X		X		X
10	RINS	Apr 09, 2018		Water	M18-Ap12242							X		X
11	QA 9-4	Apr 09, 2018		Soil	M18-Ap12243							X	X	X
12	QA 10-4	Apr 10, 2018		Soil	M18-Ap12244			X		X			X	
13	TS	Apr 11, 2018		Water	M18-Ap12245						X			
14	TB	Apr 11, 2018		Water	M18-Ap12246						X			
15	JBMW01 1.0-1.2	Apr 10, 2018		Soil	M18-Ap12247	X								

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Sample Detail						HOLD	Lead	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
16	JBMW01 2.0-2.2	Apr 10, 2018		Soil	M18-Ap12248	X								
17	JBMW01 3.0-3.2	Apr 10, 2018		Soil	M18-Ap12249	X								
18	JBMW01 4.0-4.2	Apr 10, 2018		Soil	M18-Ap12250	X								
19	JBMW01 6.0-6.2	Apr 10, 2018		Soil	M18-Ap12251	X								
20	JBMW02 0.4-0.5	Apr 09, 2018		Soil	M18-Ap12252	X								
21	JBMW02 1.4-1.5	Apr 09, 2018		Soil	M18-Ap12253	X								
22	JBMW02 2.0-2.7	Apr 09, 2018		Soil	M18-Ap12254	X								

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Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 593556
Phone: 02 8245 0300
Fax:

Received: Apr 12, 2018 10:17 AM
Due: Apr 19, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Lead	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
23	JBMW02 2.5-2.7	Apr 09, 2018		Soil	M18-Ap12255	X								
24	JBMW02 3.0-3.2	Apr 09, 2018		Soil	M18-Ap12256	X								
25	JBMW02 4.0-4.2	Apr 09, 2018		Soil	M18-Ap12257	X								
26	JBMW02 5.0-5.2	Apr 09, 2018		Soil	M18-Ap12258	X								
27	JBMW02 6.0-6.2	Apr 09, 2018		Soil	M18-Ap12259	X								
28	JBMW03 0.2-0.3	Apr 09, 2018		Soil	M18-Ap12260	X								
29	JBMW03 2.0-2.2	Apr 09, 2018		Soil	M18-Ap12261	X								

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
30	JBMW03 3.0-3.2	Apr 09, 2018		Soil	M18-Ap12262	X								
31	JBMW03 4.0-4.2	Apr 09, 2018		Soil	M18-Ap12263	X								
32	JBMW03 5.0-5.2	Apr 09, 2018		Soil	M18-Ap12264	X								
33	JBMW03 6.0-6.2	Apr 09, 2018		Soil	M18-Ap12265	X								
34	JBMW03 7.0-7.2	Apr 09, 2018		Soil	M18-Ap12266	X								
35	JBMW04 1.0-1.2	Apr 10, 2018		Soil	M18-Ap12267	X								
36	JBMW04 2.0-2.2	Apr 10, 2018		Soil	M18-Ap12268	X								

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
37	JBMW04 3.0-3.2	Apr 10, 2018		Soil	M18-Ap12269	X								
38	JBMW04 4.0-4.2	Apr 10, 2018		Soil	M18-Ap12270	X								
39	JBMW04 4.4-4.5	Apr 10, 2018		Soil	M18-Ap12271	X								
40	JBMW04 6.0-6.2	Apr 10, 2018		Soil	M18-Ap12272	X								
41	JBMW04 7.0-7.2	Apr 10, 2018		Soil	M18-Ap12273	X								
42	JBMW04 8.0-8.2	Apr 10, 2018		Soil	M18-Ap12274	X								
43	ACM-FRAG	Apr 10, 2018		Building Materials	M18-Ap12275	X								

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Sample Detail						HOLD	Lead	Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8	BTEX	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217														
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
44	JBMW04 0.2-0.3	Apr 10, 2018		Soil	M18-Ap29342			X		X		X	X	X
Test Counts						30	1	5	1	4	2	10	9	10

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Benzene	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dibromomethane	mg/L	< 0.001			0.001	Pass	
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
TRH C6-C9	%	95			70-130	Pass	
TRH C10-C14	%	77			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	110			70-130	Pass	
Toluene	%	96			70-130	Pass	
Ethylbenzene	%	88			70-130	Pass	
m&p-Xylenes	%	88			70-130	Pass	
Xylenes - Total	%	91			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	96			70-130	Pass	
1.1.1-Trichloroethane	%	96			70-130	Pass	
1.2-Dichlorobenzene	%	101			70-130	Pass	
1.2-Dichloroethane	%	111			70-130	Pass	
Benzene	%	110			70-130	Pass	
Ethylbenzene	%	88			70-130	Pass	
m&p-Xylenes	%	88			70-130	Pass	
Toluene	%	96			70-130	Pass	
Trichloroethene	%	94			70-130	Pass	
Xylenes - Total	%	91			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	81			70-130	Pass	
TRH C6-C10	%	93			70-130	Pass	
TRH >C10-C16	%	76			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	71			70-130	Pass	
Acenaphthylene	%	77			70-130	Pass	
Anthracene	%	86			70-130	Pass	
Benz(a)anthracene	%	113			70-130	Pass	
Benzo(a)pyrene	%	102			70-130	Pass	
Benzo(b&j)fluoranthene	%	98			70-130	Pass	
Benzo(g.h.i)perylene	%	90			70-130	Pass	
Benzo(k)fluoranthene	%	98			70-130	Pass	
Chrysene	%	108			70-130	Pass	
Dibenz(a.h)anthracene	%	93			70-130	Pass	
Fluoranthene	%	116			70-130	Pass	
Fluorene	%	82			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	92			70-130	Pass	
Naphthalene	%	71			70-130	Pass	
Phenanthrene	%	120			70-130	Pass	
Pyrene	%	115			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	90			80-120	Pass	
Cadmium	%	97			80-120	Pass	
Chromium	%	91			80-120	Pass	
Copper	%	91			80-120	Pass	
Lead	%	95			80-120	Pass	
Mercury	%	95			75-125	Pass	
Nickel	%	91			80-120	Pass	
Zinc	%	91			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-Ap14170	NCP	%	94			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Ap14170	NCP	%	98			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	A18-Ap19778	NCP	%	104			70-130	Pass	
Acenaphthylene	A18-Ap19778	NCP	%	83			70-130	Pass	
Anthracene	A18-Ap19778	NCP	%	86			70-130	Pass	
Benz(a)anthracene	A18-Ap19778	NCP	%	75			70-130	Pass	
Benzo(a)pyrene	A18-Ap19778	NCP	%	79			70-130	Pass	
Benzo(b&j)fluoranthene	A18-Ap19778	NCP	%	122			70-130	Pass	
Benzo(g.h.i)perylene	A18-Ap19778	NCP	%	71			70-130	Pass	
Benzo(k)fluoranthene	A18-Ap19778	NCP	%	121			70-130	Pass	
Chrysene	A18-Ap19778	NCP	%	77			70-130	Pass	
Dibenz(a.h)anthracene	A18-Ap19778	NCP	%	70			70-130	Pass	
Fluoranthene	A18-Ap19778	NCP	%	94			70-130	Pass	
Fluorene	A18-Ap19778	NCP	%	74			70-130	Pass	
Indeno(1.2.3-cd)pyrene	A18-Ap19778	NCP	%	77			70-130	Pass	
Naphthalene	A18-Ap19778	NCP	%	int			70-130	Fail	Q08
Phenanthrene	A18-Ap19778	NCP	%	106			70-130	Pass	
Pyrene	A18-Ap19778	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Ap13958	NCP	%	115			75-125	Pass	
Cadmium	M18-Ap13958	NCP	%	115			75-125	Pass	
Chromium	M18-Ap13958	NCP	%	112			75-125	Pass	
Copper	M18-Ap13958	NCP	%	113			75-125	Pass	
Lead	M18-Ap13958	NCP	%	116			75-125	Pass	
Mercury	M18-Ap13958	NCP	%	115			70-130	Pass	
Nickel	M18-Ap13958	NCP	%	113			75-125	Pass	
Zinc	P18-Ap10870	NCP	%	91			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	P18-Ap12708	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH C15-C28	P18-Ap12708	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH C29-C36	P18-Ap12708	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	P18-Ap12708	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
TRH >C16-C34	P18-Ap12708	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
TRH >C34-C40	P18-Ap12708	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	A18-Ap14023	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	A18-Ap14023	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	A18-Ap14023	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	A18-Ap14023	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	A18-Ap14023	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	A18-Ap14023	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	A18-Ap14023	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Benzo(k)fluoranthene	A18-Ap14023	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	A18-Ap14023	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	A18-Ap14023	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	A18-Ap14023	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	A18-Ap14023	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	A18-Ap14023	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	A18-Ap14023	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	A18-Ap14023	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	A18-Ap14023	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ap12058	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Cadmium	M18-Ap12058	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chromium	M18-Ap12058	NCP	mg/L	0.007	0.007	4.0	30%	Pass	
Copper	M18-Ap12058	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Lead	M18-Ap12058	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Mercury	M18-Ap12058	NCP	mg/L	< 0.0005	< 0.0005	<1	30%	Pass	
Nickel	M18-Ap12058	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	

Comments

This report has been revised (V3) to include test results for sample M18-Ap29342 and to remove the results from sample M18-Ap12239.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Enviro Sample Vic

From: Nibha Vaidya
Sent: Monday, 30 April 2018 9:23 PM
To: Enviro Sample Vic
Subject: RE: 5 DAY TAT - FW: Eurofins | mgt Amended Test Results - Report 593556 : Site PENRITH (52372)

Follow Up Flag: Follow up
Flag Status: Flagged

Just a reminder – waiting to be logged

Kind Regards,

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

From: Nibha Vaidya
Sent: Monday, 30 April 2018 4:54 PM
To: Enviro Sample Vic
Subject: 5 DAY TAT - FW: Eurofins | mgt Amended Test Results - Report 593556 : Site PENRITH (52372)

Additional analysis please – 5 day TAT

Kind Regards,

30/4 4.54pm 593225

Nibha Vaidya
Phone : +61 2 9900 8415
Mobile : +61 499 900 805
Email : NibhaVaidya@eurofins.com

From: Rohan Hammond [mailto:RHammond@jbsg.com.au]
Sent: Monday, 30 April 2018 4:44 PM
To: Nibha Vaidya
Subject: RE: Eurofins | mgt Amended Test Results - Report 593556 : Site PENRITH (52372)

EXTERNAL EMAIL*

Hi Nibha,

HOLD

Thank you for that.

One last round to schedule here:

- JBMW03 2.0-2.1: PAHs and lead Ap12261 5.9 ds 10/4
- JBMW04 1.0-1.2: TRHs and VOCs 12267 522

Standard turn around time – I unersand we are out of holding times for some analytes.

Rohan.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Site # 1254 & 14271

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NATA # 1261 Site # 18217

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NATA # 1261 Site # 20794

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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Rohan Hammond
Project name: PENRITH
Project ID: 52372
COC number: Not provided
Turn around time: 5 Day
Date/Time received: Apr 30, 2018 4:54 PM
Eurofins | mgt reference: **596225**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Rohan Hammond - rhammond@jbsg.com.au.

Note: A copy of these results will also be delivered to the general JBS & G Australia (NSW) P/L email address.

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

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NATA # 1261 Site # 18217

Brisbane
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NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 596225
Phone: 02 8245 0300
Fax:

Received: Apr 30, 2018 4:54 PM
Due: May 7, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Lead	Polycyclic Aromatic Hydrocarbons	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
External Laboratory										
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
1	JBMW03 2.0-2.1	Apr 10, 2018		Soil	M18-My00076	X	X		X	
2	JBMW04 1.0-1.2	Apr 10, 2018		Soil	M18-My00077			X	X	X
Test Counts						1	1	1	2	1

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **596225-S**
Project name PENRITH
Project ID 52372
Received Date Apr 30, 2018

Client Sample ID			**JBMW03 2.0-2.1**	**JBMW04 1.0-1.2**
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-My00076**	**M18-My00077**
Date Sampled			**Apr 10, 2018**	**Apr 10, 2018**
Test/Reference	LOR	Unit		
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				
TRH C6-C9	20	mg/kg	-	< 20
TRH C10-C14	20	mg/kg	-	< 20
TRH C15-C28	50	mg/kg	-	< 50
TRH C29-C36	50	mg/kg	-	< 50
TRH C10-36 (Total)	50	mg/kg	-	< 50
Volatile Organics				
1.1-Dichloroethane	0.5	mg/kg	-	< 0.5
1.1-Dichloroethene	0.5	mg/kg	-	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	-	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	-	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	-	< 0.5
1.2-Dibromoethane	0.5	mg/kg	-	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	-	< 0.5
1.2-Dichloroethane	0.5	mg/kg	-	< 0.5
1.2-Dichloropropane	0.5	mg/kg	-	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	-	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	-	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	-	< 0.5
1.3-Dichloropropane	0.5	mg/kg	-	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	-	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	-	< 0.5
2-Butanone (MEK)	0.5	mg/kg	-	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	-	< 0.5
4-Chlorotoluene	0.5	mg/kg	-	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	-	< 0.5
Allyl chloride	0.5	mg/kg	-	< 0.5
Benzene	0.1	mg/kg	-	< 0.1
Bromobenzene	0.5	mg/kg	-	< 0.5
Bromochloromethane	0.5	mg/kg	-	< 0.5
Bromodichloromethane	0.5	mg/kg	-	< 0.5
Bromoform	0.5	mg/kg	-	< 0.5
Bromomethane	0.5	mg/kg	-	< 0.5
Carbon disulfide	0.5	mg/kg	-	< 0.5
Carbon Tetrachloride	0.5	mg/kg	-	< 0.5

Client Sample ID			JBMW03 2.0-2.1	JBMW04 1.0-1.2
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-My00076**	**M18-My00077**
Date Sampled			**Apr 10, 2018**	**Apr 10, 2018**
Test/Reference	LOR	Unit		
Volatile Organics				
Chlorobenzene	0.5	mg/kg	-	< 0.5
Chloroethane	0.5	mg/kg	-	< 0.5
Chloroform	0.5	mg/kg	-	< 0.5
Chloromethane	0.5	mg/kg	-	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5
Dibromochloromethane	0.5	mg/kg	-	< 0.5
Dibromomethane	0.5	mg/kg	-	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	-	< 0.5
Ethylbenzene	0.1	mg/kg	-	< 0.1
Iodomethane	0.5	mg/kg	-	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	-	< 0.5
m&p-Xylenes	0.2	mg/kg	-	< 0.2
Methylene Chloride	0.5	mg/kg	-	< 0.5
o-Xylene	0.1	mg/kg	-	< 0.1
Styrene	0.5	mg/kg	-	< 0.5
Tetrachloroethene	0.5	mg/kg	-	< 0.5
Toluene	0.1	mg/kg	-	< 0.1
trans-1.2-Dichloroethene	0.5	mg/kg	-	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	-	< 0.5
Trichloroethene	0.5	mg/kg	-	< 0.5
Trichlorofluoromethane	0.5	mg/kg	-	< 0.5
Vinyl chloride	0.5	mg/kg	-	< 0.5
Xylenes - Total	0.3	mg/kg	-	< 0.3
Total MAH*	0.5	mg/kg	-	< 0.5
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	-	< 0.5
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	-	< 0.5
4-Bromofluorobenzene (surr.)	1	%	-	63
Toluene-d8 (surr.)	1	%	-	63
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
Naphthalene[N02]	0.5	mg/kg	-	< 0.5
TRH C6-C10	20	mg/kg	-	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	-	< 20
TRH >C10-C16	50	mg/kg	-	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	-	< 50
TRH >C16-C34	100	mg/kg	-	< 100
TRH >C34-C40	100	mg/kg	-	< 100
Polycyclic Aromatic Hydrocarbons				
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-
Acenaphthene	0.5	mg/kg	< 0.5	-
Acenaphthylene	0.5	mg/kg	< 0.5	-
Anthracene	0.5	mg/kg	< 0.5	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-

Client Sample ID			JBMW03 2.0-2.1	JBMW04 1.0-1.2
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**M18-My00076**	**M18-My00077**
Date Sampled			**Apr 10, 2018**	**Apr 10, 2018**
Test/Reference	LOR	Unit		
Polycyclic Aromatic Hydrocarbons				
Chrysene	0.5	mg/kg	< 0.5	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-
Fluoranthene	0.5	mg/kg	< 0.5	-
Fluorene	0.5	mg/kg	< 0.5	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-
Naphthalene	0.5	mg/kg	< 0.5	-
Phenanthrene	0.5	mg/kg	< 0.5	-
Pyrene	0.5	mg/kg	< 0.5	-
Total PAH*	0.5	mg/kg	< 0.5	-
2-Fluorobiphenyl (surr.)	1	%	60	-
p-Terphenyl-d14 (surr.)	1	%	53	-
Heavy Metals				
Lead	5	mg/kg	15	-
% Moisture	1	%	23	17

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	May 03, 2018	14 Day
- Method: LTM-ORG-2010 TRH C6-C36			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	May 03, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	May 03, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Volatile Organics	Melbourne	May 03, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Polycyclic Aromatic Hydrocarbons	Melbourne	May 03, 2018	14 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Heavy Metals	Melbourne	May 03, 2018	180 Day
- Method: LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)			
% Moisture	Melbourne	May 01, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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NATA # 1261 Site # 18217

Brisbane
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NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 52372

Order No.:
Report #: 596225
Phone: 02 8245 0300
Fax:

Received: Apr 30, 2018 4:54 PM
Due: May 7, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Lead	Polycyclic Aromatic Hydrocarbons	Volatile Organics	Moisture Set	Total Recoverable Hydrocarbons
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X
Sydney Laboratory - NATA Site # 18217										
Brisbane Laboratory - NATA Site # 20794										
Perth Laboratory - NATA Site # 23736										
External Laboratory										
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**					
1	JBMW03 2.0-2.1	Apr 10, 2018		Soil	M18-My00076	X	X		X	
2	JBMW04 1.0-1.2	Apr 10, 2018		Soil	M18-My00077			X	X	X
Test Counts						1	1	1	2	1

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dibromoethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
2-Butanone (MEK)	mg/kg	< 0.5			0.5	Pass	
2-Propanone (Acetone)	mg/kg	< 0.5			0.5	Pass	
4-Chlorotoluene	mg/kg	< 0.5			0.5	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.5			0.5	Pass	
Allyl chloride	mg/kg	< 0.5			0.5	Pass	
Benzene	mg/kg	< 0.1			0.1	Pass	
Bromobenzene	mg/kg	< 0.5			0.5	Pass	
Bromochloromethane	mg/kg	< 0.5			0.5	Pass	
Bromodichloromethane	mg/kg	< 0.5			0.5	Pass	
Bromoform	mg/kg	< 0.5			0.5	Pass	
Bromomethane	mg/kg	< 0.5			0.5	Pass	
Carbon disulfide	mg/kg	< 0.5			0.5	Pass	
Carbon Tetrachloride	mg/kg	< 0.5			0.5	Pass	
Chlorobenzene	mg/kg	< 0.5			0.5	Pass	
Chloroethane	mg/kg	< 0.5			0.5	Pass	
Chloroform	mg/kg	< 0.5			0.5	Pass	
Chloromethane	mg/kg	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Dibromochloromethane	mg/kg	< 0.5			0.5	Pass	
Dibromomethane	mg/kg	< 0.5			0.5	Pass	
Dichlorodifluoromethane	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
Iodomethane	mg/kg	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	mg/kg	< 0.5			0.5	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
Methylene Chloride	mg/kg	< 0.5			0.5	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Styrene	mg/kg	< 0.5			0.5	Pass	
Tetrachloroethene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
trans-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Trichloroethene	mg/kg	< 0.5			0.5	Pass	
Trichlorofluoromethane	mg/kg	< 0.5			0.5	Pass	
Vinyl chloride	mg/kg	< 0.5			0.5	Pass	
Xylenes - Total	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Lead	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	128			70-130	Pass	
TRH C10-C14	%	91			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	75			70-130	Pass	
1.1.1-Trichloroethane	%	74			70-130	Pass	
1.2-Dichlorobenzene	%	112			70-130	Pass	
1.2-Dichloroethane	%	74			70-130	Pass	
Benzene	%	95			70-130	Pass	
Ethylbenzene	%	108			70-130	Pass	
m&p-Xylenes	%	110			70-130	Pass	
Toluene	%	97			70-130	Pass	
Trichloroethene	%	83			70-130	Pass	
Xylenes - Total	%	107			70-130	Pass	
LCS - % Recovery							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	126			70-130	Pass	
TRH C6-C10	%	117			70-130	Pass	
TRH >C10-C16	%	87			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	83			70-130	Pass	
Acenaphthylene	%	89			70-130	Pass	
Anthracene	%	83			70-130	Pass	
Benz(a)anthracene	%	71			70-130	Pass	
Benzo(a)pyrene	%	86			70-130	Pass	
Benzo(b&j)fluoranthene	%	85			70-130	Pass	
Benzo(g.h.i)perylene	%	95			70-130	Pass	
Benzo(k)fluoranthene	%	95			70-130	Pass	
Chrysene	%	74			70-130	Pass	
Dibenz(a.h)anthracene	%	77			70-130	Pass	
Fluoranthene	%	71			70-130	Pass	
Fluorene	%	84			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	93			70-130	Pass	
Naphthalene	%	70			70-130	Pass	
Phenanthrene	%	78			70-130	Pass	
Pyrene	%	71			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Lead	%	102			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S18-My01399	NCP	%	89			70-130	Pass	
Acenaphthylene	S18-My01399	NCP	%	95			70-130	Pass	
Anthracene	S18-My01399	NCP	%	80			70-130	Pass	
Benz(a)anthracene	S18-My01399	NCP	%	91			70-130	Pass	
Benzo(a)pyrene	S18-My01399	NCP	%	91			70-130	Pass	
Benzo(b&j)fluoranthene	S18-My01399	NCP	%	80			70-130	Pass	
Benzo(g.h.i)perylene	S18-My01399	NCP	%	106			70-130	Pass	
Benzo(k)fluoranthene	S18-My01399	NCP	%	100			70-130	Pass	
Chrysene	S18-My01399	NCP	%	95			70-130	Pass	
Dibenz(a.h)anthracene	S18-My01399	NCP	%	81			70-130	Pass	
Fluoranthene	S18-My01399	NCP	%	86			70-130	Pass	
Fluorene	S18-My01399	NCP	%	86			70-130	Pass	
Indeno(1.2.3-cd)pyrene	S18-My01399	NCP	%	105			70-130	Pass	
Naphthalene	S18-My01399	NCP	%	95			70-130	Pass	
Phenanthrene	S18-My01399	NCP	%	85			70-130	Pass	
Pyrene	S18-My01399	NCP	%	86			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Lead	M18-Ap33942	NCP	%	109			75-125	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S18-Ap33959	NCP	%	112			70-130	Pass	
TRH C10-C14	M18-My00985	NCP	%	76			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethene	A18-Ap32875	NCP	%	92			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.1.1-Trichloroethane	A18-Ap32875	NCP	%	79			70-130	Pass	
1.2-Dichlorobenzene	M18-My00948	NCP	%	84			70-130	Pass	
1.2-Dichloroethane	A18-Ap32875	NCP	%	116			70-130	Pass	
Benzene	M18-My00948	NCP	%	74			70-130	Pass	
Ethylbenzene	M18-My00948	NCP	%	76			70-130	Pass	
m&p-Xylenes	M18-My00948	NCP	%	75			70-130	Pass	
o-Xylene	M18-My00948	NCP	%	71			70-130	Pass	
Toluene	M18-My00948	NCP	%	74			70-130	Pass	
Trichloroethene	M18-My00948	NCP	%	73			70-130	Pass	
Xylenes - Total	M18-My00948	NCP	%	74			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	M18-My00948	NCP	%	84			70-130	Pass	
TRH C6-C10	S18-Ap33959	NCP	%	112			70-130	Pass	
TRH >C10-C16	M18-My00985	NCP	%	73			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S18-My01398	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S18-My01398	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S18-My01398	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S18-My01398	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S18-My01398	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S18-My01398	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S18-My01398	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S18-My01398	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S18-My01398	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S18-My01398	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S18-My01398	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S18-My01398	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S18-My01398	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S18-My01398	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S18-My01398	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S18-My01398	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Lead	M18-Ap33942	NCP	mg/kg	6.8	6.9	1.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	M18-My00018	NCP	%	16	17	4.0	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	M18-My03930	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	M18-My01309	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	M18-My01309	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH C29-C36	M18-My01309	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1-Dichloroethene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1-Trichloroethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2-Trichloroethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.2-Dibromoethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichlorobenzene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloroethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloropropane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3-Trichloropropane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trimethylbenzene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichlorobenzene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichloropropane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3.5-Trimethylbenzene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.4-Dichlorobenzene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Butanone (MEK)	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Propanone (Acetone)	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chlorotoluene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Allyl chloride	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzene	M18-My00925	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Bromobenzene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromochloromethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromodichloromethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromoform	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromomethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon disulfide	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon Tetrachloride	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chlorobenzene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroform	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloromethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.2-Dichloroethene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.3-Dichloropropene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromochloromethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromomethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorodifluoromethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Ethylbenzene	M18-My00925	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Iodomethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Isopropyl benzene (Cumene)	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
m&p-Xylenes	M18-My00925	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Methylene Chloride	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
o-Xylene	M18-My00925	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Styrene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Tetrachloroethene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Toluene	M18-My00925	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
trans-1.2-Dichloroethene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.3-Dichloropropene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichloroethene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichlorofluoromethane	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Vinyl chloride	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Xylenes - Total	M18-My00925	NCP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	M18-My00925	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	M18-My03930	NCP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	M18-My01309	NCP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	M18-My01309	NCP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	M18-My01309	NCP	mg/kg	< 100	< 100	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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010452

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52372
PROJECT NAME: Perth
DATE NEEDED BY: Std
PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688
SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) RHammond@jbsg.com.au; (3) .....@jbsg.com.au

LABORATORY BATCH NO.:
SAMPLERS: RH
QC LEVEL: NEPM (2013)

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:
+ Carbon tubes shipped ambient
+ Water samples chilled

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	TRH	VOCs	Isopropyl Alcohol VTRH	BTEX	8 Metals	PAHs (LL)	5x TRHs	PAHs	HOLD	BTEX	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
SU11	Carbon	17-4-18	-	Carbon tube - Ambient	-	X	X	X										
12						X	X	X										
13						X	X	X										
14						X	X	X										
15						X	X	X										
16						X	X	X										
17						X	X	X										
QC20180417						X	X	X										
MB						X	X	X										
BSH01	Water	16-4-18	u	4x40mL HCL + 250mL Amber		X	X								X			
02			b			X	X								X			
03			s			X	X								X			
JBHW01			s			X	X								X			
02			s			X	X								X			
03			b	+100mL Nitric, +1L Amber		X	X								X			
04			s			X	X								X			
TS/TB			22	4x40mL Vial HCL				[illegible]	X									
RINS			b	4x HCL + 250mL Amber		X	X			X		X			X			
QC20180416			s	4x HCL		[illegible]	X		X						X			

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Rohan M DATE: 18-4-18 OF: JBS&G	CONSIGNMENT NOTE NO. TRANSPORT CO.	NAME: Elvied DATE: 18/4/18 12:15pm OF: Eurofins	COOLER SEAL – Yes..... No ..... Intact ..... Broken ..... COOLER TEMP ..... deg C
NAME: DATE: OF:	CONSIGNMENT NOTE NO. TRANSPORT CO	NAME: DATE: OF:	COOLER SEAL – Yes..... No ..... Intact ..... Broken ..... COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody - Generic

QC20180416-1 Water 16-4-18 1xL Amber + 100mL Nitric XXX
SU14-1L Carbon 17-4-18 Carbon tube

594882

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Enviro Sample Vic

From: Rohan Hammond <RHammond@jbsg.com.au>
Sent: Friday, 20 April 2018 1:25 PM
To: Enviro Sample Vic
Subject: Re: Eurofins | mgt Sample Receipt Advice - Report 594882 : Site PENRITH (53272)

Follow Up Flag: Follow up
Flag Status: Completed

Hi guys, I have a couple of edits to this analytical request:

- Confirming the analyses for PSM01 is as follows: TRH/BTEX and VOCs, as per the provided COC - currently the SRA indicates only vTRHs and VOCs have been scheduled;
- Regarding the carbon tubes, only analyse the samples SV11-SV17 and QC20180417 for VOCs. No TRHs analysis is required – I understand this change will set back the delivery date to Friday 27 April.

Kind Regards,
Rohan Hammond

Rohan Hammond | Environmental Consultant | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane
Level 1, 50 Margaret Street Sydney NSW 2000
T: 02 8245 0300 | M: 0430 379 445| www.jbsg.com.au
Contaminated Land | Groundwater Remediation | Auditing and Compliance | Assessments and Approvals | Occupational Hygiene and Monitoring

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---

From: EnviroSampleVic@eurofins.com <EnviroSampleVic@eurofins.com>
Sent: 20 April 2018 11:21:22
To: Rohan Hammond
Subject: Eurofins | mgt Sample Receipt Advice - Report 594882 : Site PENRITH (53272)

Dear Valued Client,

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Regards

Catherine Wilson
Sample Receipt

Eurofins | mgt
2-5 Kingston Town Close
OAKLEIGH VIC 3166
AUSTRALIA
Phone: +61 385 645 000
Email: envirosamplevic@eurofins.com
Website:environment.eurofins.com.au
EnviroNote 1076 - PFAS Biota
EnviroNote 1074 - Passive Samplers for VOCs in Air

Click here to report this email as spam.

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NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Rohan Hammond
Project name: PENRITH
Project ID: 53272
COC number: 010452
Turn around time: 5 Day
Date/Time received: Apr 18, 2018 12:15 PM
Eurofins | mgt reference: **594882**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 12.3 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Only Vials received for sample PSM01

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Rohan Hammond - rhammond@jbsg.com.au.

Note: A copy of these results will also be delivered to the general JBS & G Australia (NSW) P/L email address.

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 53272

Order No.:
Report #: 594882
Phone: 02 8245 0300
Fax:

Received: Apr 18, 2018 12:15 PM
Due: Apr 26, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Isopropanol	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Total Recoverable Hydrocarbons - 2013 NEPM Fractions	VOC AIR-TRH (Total Recoverable Hydrocarbons)	Volatile Organics	VOCs in Ambient Air by GC/MS	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH	Polycyclic Aromatic Hydrocarbons (low level)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	SV11 - FRONT	Apr 17, 2018		Air	M18-Ap23249		X								X			
2	SV11 - BACK	Apr 17, 2018		Air	M18-Ap23250		X								X			
3	SV12 - FRONT	Apr 17, 2018		Air	M18-Ap23251		X								X			
4	SV12 - BACK	Apr 17, 2018		Air	M18-Ap23252		X								X			
5	SV13 - FRONT	Apr 17, 2018		Air	M18-Ap23253		X								X			
6	SV13 - BACK	Apr 17, 2018		Air	M18-Ap23254		X								X			
7	SV14 - FRONT	Apr 17, 2018		Air	M18-Ap23255		X								X			

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
8	SV14 - BACK	Apr 17, 2018		Air	M18-Ap23256		X								X			
9	SV15 - FRONT	Apr 17, 2018		Air	M18-Ap23257		X								X			
10	SV15 - BACK	Apr 17, 2018		Air	M18-Ap23258		X								X			
11	SV16 - FRONT	Apr 17, 2018		Air	M18-Ap23259		X								X			
12	SV16 - BACK	Apr 17, 2018		Air	M18-Ap23260		X								X			
13	SV17 - FRONT	Apr 17, 2018		Air	M18-Ap23261		X								X			
14	SV17 - BACK	Apr 17, 2018		Air	M18-Ap23262		X								X			
15	QC20180417 - FRONT	Apr 17, 2018		Air	M18-Ap23263		X								X			
16	QC20180417 - BACK	Apr 17, 2018		Air	M18-Ap23264		X								X			

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
17	MB - FRONT	Apr 17, 2018		Air	M18-Ap23265		X						X		X			
18	MB - BACK	Apr 17, 2018		Air	M18-Ap23266		X						X		X			
19	SV14L - FRONT	Apr 17, 2018		Air	M18-Ap23267	X												
20	SV14L - BACK	Apr 17, 2018		Air	M18-Ap23268	X												
21	PSM01	Apr 16, 2018		Water	M18-Ap23269									X			X	
22	PSM02	Apr 16, 2018		Water	M18-Ap23270						X			X		X		
23	PSM03	Apr 16, 2018		Water	M18-Ap23271						X			X		X		
24	JBMW01	Apr 16, 2018		Water	M18-Ap23272						X			X		X		
25	JBMW02	Apr 16, 2018		Water	M18-Ap23273						X			X		X		
26	JBMW03	Apr 16, 2018		Water	M18-Ap23274						X			X		X		
27	JBMW04	Apr 16, 2018		Water	M18-Ap23275						X			X		X		

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
28	TS	Apr 16, 2018		Water	M18-Ap23276						X							
29	TB	Apr 16, 2018		Water	M18-Ap23277						X							
30	RINS	Apr 16, 2018		Water	M18-Ap23278				X	X	X			X		X		
31	QC20180416	Apr 16, 2018		Water	M18-Ap23279									X			X	
32	QC20180416-1	Apr 16, 2018		Water	M18-Ap23280			X		X		X						X
Test Counts						2	18	1	1	2	9	1	2	9	18	7	2	1

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	SV11 - FRONT	Apr 17, 2018		Air	M18-Ap23249		X								X			
2	SV11 - BACK	Apr 17, 2018		Air	M18-Ap23250		X								X			
3	SV12 - FRONT	Apr 17, 2018		Air	M18-Ap23251		X								X			
4	SV12 - BACK	Apr 17, 2018		Air	M18-Ap23252		X								X			
5	SV13 - FRONT	Apr 17, 2018		Air	M18-Ap23253		X								X			
6	SV13 - BACK	Apr 17, 2018		Air	M18-Ap23254		X								X			
7	SV14 - FRONT	Apr 17, 2018		Air	M18-Ap23255		X								X			

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 53272

Order No.:
Report #: 594882
Phone: 02 8245 0300
Fax:

Received: Apr 18, 2018 12:15 PM
Due: Apr 26, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Isopropanol	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Total Recoverable Hydrocarbons - 2013 NEPM Fractions	VOC AIR-TRH (Total Recoverable Hydrocarbons)	Volatile Organics	VOCs in Ambient Air by GC/MS	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH	Polycyclic Aromatic Hydrocarbons (low level)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
8	SV14 - BACK	Apr 17, 2018		Air	M18-Ap23256		X								X			
9	SV15 - FRONT	Apr 17, 2018		Air	M18-Ap23257		X								X			
10	SV15 - BACK	Apr 17, 2018		Air	M18-Ap23258		X								X			
11	SV16 - FRONT	Apr 17, 2018		Air	M18-Ap23259		X								X			
12	SV16 - BACK	Apr 17, 2018		Air	M18-Ap23260		X								X			
13	SV17 - FRONT	Apr 17, 2018		Air	M18-Ap23261		X								X			
14	SV17 - BACK	Apr 17, 2018		Air	M18-Ap23262		X								X			
15	QC20180417 - FRONT	Apr 17, 2018		Air	M18-Ap23263		X								X			
16	QC20180417 - BACK	Apr 17, 2018		Air	M18-Ap23264		X								X			

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18	MB - BACK	Apr 17, 2018		Air	M18-Ap23266		X						X		X			
19	SV14L - FRONT	Apr 17, 2018		Air	M18-Ap23267	X												
20	SV14L - BACK	Apr 17, 2018		Air	M18-Ap23268	X												
21	PSM01	Apr 16, 2018		Water	M18-Ap23269									X			X	
22	PSM02	Apr 16, 2018		Water	M18-Ap23270						X			X		X		
23	PSM03	Apr 16, 2018		Water	M18-Ap23271						X			X		X		
24	JBMW01	Apr 16, 2018		Water	M18-Ap23272						X			X		X		
25	JBMW02	Apr 16, 2018		Water	M18-Ap23273						X			X		X		
26	JBMW03	Apr 16, 2018		Water	M18-Ap23274						X			X		X		
27	JBMW04	Apr 16, 2018		Water	M18-Ap23275						X			X		X		

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Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
28	TS	Apr 16, 2018		Water	M18-Ap23276						X							
29	TB	Apr 16, 2018		Water	M18-Ap23277						X							
30	RINS	Apr 16, 2018		Water	M18-Ap23278				X	X	X			X		X		
31	QC20180416	Apr 16, 2018		Water	M18-Ap23279									X			X	
32	QC20180416-1	Apr 16, 2018		Water	M18-Ap23280			X		X		X						X
Test Counts						2	18	1	1	2	9	1	2	9	18	7	2	1

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010452

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52372
PROJECT NAME: Perth
DATE NEEDED BY: Std
PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688
SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) RHammond@jbsg.com.au; (3) .....@jbsg.com.au

LABORATORY BATCH NO.:
SAMPLERS: RH
QC LEVEL: NEPM (2013)

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:
+ Carbon tubes shipped ambient
+ Water samples chilled

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	TRH	VOCs	Isopropyl Alcohol VTRH	BTEX	8 Metals	PAHs (LL)	5x TRHs	PAHs	HOLD	BTEX	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
SU11	Carbon	17-4-18	-	Carbon tube - Ambient	-	X	X	X										
12						X	X	X										
13						X	X	X										
14						X	X	X										
15						X	X	X										
16						X	X	X										
17						X	X	X										
QC20180417						X	X	X										
MB						X	X	X										
BSH01	Water	16-4-18	u	4x40mL HCL + 250mL Amber		X	X								X			
02			b			X	X								X			
03			s			X	X								X			
JBHW01			s			X	X								X			
02			s			X	X								X			
03			b	+100mL Nitric, +1L Amber		X	X								X			
04			s			X	X								X			
TS/TB			22	4x40mL Vial HCL				[illegible]	X									
RINS			b	4x HCL + 250mL Amber		X	X			X		X			X			
QC20180416			s	4x HCL		[illegible]	X		X						X			

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Rohan M DATE: 18-4-18 OF: JBS&G	CONSIGNMENT NOTE NO. TRANSPORT CO.	NAME: Elvied DATE: 18/4/18 12:15pm OF: Eurofins	COOLER SEAL – Yes..... No ..... Intact ..... Broken ..... COOLER TEMP ..... deg C
NAME: DATE: OF:	CONSIGNMENT NOTE NO. TRANSPORT CO	NAME: DATE: OF:	COOLER SEAL – Yes..... No ..... Intact ..... Broken ..... COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody - Generic

QC20180416-1 Water 16-4-18 1xL Amber + 100mL Nitric XXX
SU14-1L Carbon 17-4-18 Carbon tube

594882

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Version: 1, Version Date: 14/04/2021

Enviro Sample Vic

From: Rohan Hammond <RHammond@jbsg.com.au>
Sent: Friday, 20 April 2018 1:25 PM
To: Enviro Sample Vic
Subject: Re: Eurofins | mgt Sample Receipt Advice - Report 594882 : Site PENRITH (53272)

Follow Up Flag: Follow up
Flag Status: Completed

Hi guys, I have a couple of edits to this analytical request:

- Confirming the analyses for PSM01 is as follows: TRH/BTEX and VOCs, as per the provided COC - currently the SRA indicates only vTRHs and VOCs have been scheduled;
- Regarding the carbon tubes, only analyse the samples SV11-SV17 and QC20180417 for VOCs. No TRHs analysis is required – I understand this change will set back the delivery date to Friday 27 April.

Kind Regards,
Rohan Hammond

Rohan Hammond | Environmental Consultant | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane
Level 1, 50 Margaret Street Sydney NSW 2000
T: 02 8245 0300 | M: 0430 379 445| www.jbsg.com.au
Contaminated Land | Groundwater Remediation | Auditing and Compliance | Assessments and Approvals | Occupational Hygiene and Monitoring

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---

From: EnviroSampleVic@eurofins.com <EnviroSampleVic@eurofins.com>
Sent: 20 April 2018 11:21:22
To: Rohan Hammond
Subject: Eurofins | mgt Sample Receipt Advice - Report 594882 : Site PENRITH (53272)

Dear Valued Client,

Please find attached a Sample Receipt Advice (SRA), a Summary Sheet and a scanned copy of your Chain-of-Custody (COC). It is important that you check this documentation to ensure that the details are correct such as the Client Job Number, Turn Around Time, any comments in the Notes section and sample numbers as well as the requested analysis. If there are any irregularities then please contact your Eurofins | mgt Analytical Services Manager as soon as possible to make certain that they get changed.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Regards

Catherine Wilson
Sample Receipt

Eurofins | mgt
2-5 Kingston Town Close
OAKLEIGH VIC 3166
AUSTRALIA
Phone: +61 385 645 000
Email: envirosamplevic@eurofins.com
Website:environment.eurofins.com.au
EnviroNote 1076 - PFAS Biota
EnviroNote 1074 - Passive Samplers for VOCs in Air

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ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Rohan Hammond
Project name: PENRITH
Project ID: 53272
COC number: 010452
Turn around time: 5 Day
Date/Time received: Apr 18, 2018 12:15 PM
Eurofins | mgt reference: **594882**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 12.3 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Only Vials received for sample PSM01

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Rohan Hammond - rhammond@jbsg.com.au.

Note: A copy of these results will also be delivered to the general JBS & G Australia (NSW) P/L email address.

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Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
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External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
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Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 53272

Order No.:
Report #: 594882
Phone: 02 8245 0300
Fax:

Received: Apr 18, 2018 12:15 PM
Due: Apr 26, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Isopropanol	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Total Recoverable Hydrocarbons - 2013 NEPM Fractions	VOC AIR-TRH (Total Recoverable Hydrocarbons)	Volatile Organics	VOCs in Ambient Air by GC/MS	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH	Polycyclic Aromatic Hydrocarbons (low level)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
28	TS	Apr 16, 2018		Water	M18-Ap23276						X							
29	TB	Apr 16, 2018		Water	M18-Ap23277						X							
30	RINS	Apr 16, 2018		Water	M18-Ap23278				X	X	X			X		X		
31	QC20180416	Apr 16, 2018		Water	M18-Ap23279									X			X	
32	QC20180416-1	Apr 16, 2018		Water	M18-Ap23280			X		X		X						X
Test Counts						2	18	1	1	2	9	1	2	9	18	7	2	1

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **594882-A**
Project name PENRITH
Project ID 53272
Received Date Apr 18, 2018

Client Sample ID **Sample Matrix** **Eurofins | mgt Sample No.** **Date Sampled** Test/Reference	LOR	Unit	**SV11 - FRONT** **Air** **M18-Ap23249** **Apr 17, 2018**	**SV11 - BACK** **Air** **M18-Ap23250** **Apr 17, 2018**	**SV12 - FRONT** **Air** **M18-Ap23251** **Apr 17, 2018**	**SV12 - BACK** **Air** **M18-Ap23252** **Apr 17, 2018**
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV11 - FRONT	SV11 - BACK	SV12 - FRONT	SV12 - BACK
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			M18-Ap23249	M18-Ap23250	M18-Ap23251	M18-Ap23252
Date Sampled			Apr 17, 2018	Apr 17, 2018	Apr 17, 2018	Apr 17, 2018
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	4.0	< 0.5	< 0.5	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total	1.5	Total ug	< 1.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	115	97	99	89
4-Bromofluorobenzene (surr.)	1	%	91	73	75	66
Dibromofluoromethane (surr.)	1	%	128	107	109	97
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV13 - FRONT	SV13 - BACK	SV14 - FRONT	SV14 - BACK
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			M18-Ap23253	M18-Ap23254	M18-Ap23255	M18-Ap23256
Date Sampled			Apr 17, 2018	Apr 17, 2018	Apr 17, 2018	Apr 17, 2018
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Client Sample ID			SV13 - FRONT	SV13 - BACK	SV14 - FRONT	SV14 - BACK
Sample Matrix			**Air**	**Air**	**Air**	**Air**
Eurofins | mgt Sample No.			**M18-Ap23253**	**M18-Ap23254**	**M18-Ap23255**	**M18-Ap23256**
Date Sampled			**Apr 17, 2018**	**Apr 17, 2018**	**Apr 17, 2018**	**Apr 17, 2018**
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	< 0.5	< 0.5	1000	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5	69	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total	1.5	Total ug	< 1.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	103	94	103	95
4-Bromofluorobenzene (surr.)	1	%	73	71	74	77
Dibromofluoromethane (surr.)	1	%	116	104	109	104
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV15 - FRONT	SV15 - BACK	SV16 - FRONT	SV16 - BACK
Sample Matrix			**Air**	**Air**	**Air**	**Air**
Eurofins | mgt Sample No.			**M18-Ap23257**	**M18-Ap23258**	**M18-Ap23259**	**M18-Ap23260**
Date Sampled			**Apr 17, 2018**	**Apr 17, 2018**	**Apr 17, 2018**	**Apr 17, 2018**
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10

Client Sample ID			SV15 - FRONT	SV15 - BACK	SV16 - FRONT	SV16 - BACK
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			M18-Ap23257	M18-Ap23258	M18-Ap23259	M18-Ap23260
Date Sampled			Apr 17, 2018	Apr 17, 2018	Apr 17, 2018	Apr 17, 2018
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	< 0.5	< 0.5	38	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5	4.2	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total	1.5	Total ug	< 1.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	81	82	95	102
4-Bromofluorobenzene (surr.)	1	%	61	61	75	83
Dibromofluoromethane (surr.)	1	%	91	89	104	110
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV15 - FRONT	SV15 - BACK	SV16 - FRONT	SV16 - BACK
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			M18-Ap23257	M18-Ap23258	M18-Ap23259	M18-Ap23260
Date Sampled			Apr 17, 2018	Apr 17, 2018	Apr 17, 2018	Apr 17, 2018
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV17 - FRONT	SV17 - BACK	QC20180417 - FRONT	QC20180417 - BACK
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			M18-Ap23261	M18-Ap23262	M18-Ap23263	M18-Ap23264
Date Sampled			Apr 17, 2018	Apr 17, 2018	Apr 17, 2018	Apr 17, 2018
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV17 - FRONT	SV17 - BACK	QC20180417 - FRONT	QC20180417 - BACK
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			M18-Ap23261	M18-Ap23262	M18-Ap23263	M18-Ap23264
Date Sampled			Apr 17, 2018	Apr 17, 2018	Apr 17, 2018	Apr 17, 2018
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total	1.5	Total ug	< 1.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	96	99	93	102
4-Bromofluorobenzene (surr.)	1	%	79	82	74	82
Dibromofluoromethane (surr.)	1	%	104	106	101	111
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			MB - FRONT	MB - BACK
Sample Matrix			Air	Air
Eurofins | mgt Sample No.			M18-Ap23265	M18-Ap23266
Date Sampled			Apr 17, 2018	Apr 17, 2018
Test/Reference	LOR	Unit		
Isopropanol	10	Total ug	< 10	< 10
VOCs in Ambient Air by GC/MS				
Naphthalene	0.5	Total ug	< 0.5	< 0.5
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5

Client Sample ID			MB - FRONT	MB - BACK
Sample Matrix			Air	Air
Eurofins | mgt Sample No.			M18-Ap23265	M18-Ap23266
Date Sampled			Apr 17, 2018	Apr 17, 2018
Test/Reference	LOR	Unit		
VOCs in Ambient Air by GC/MS				
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	< 0.5	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5
Xylenes - Total	1.5	Total ug	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	106	104
4-Bromofluorobenzene (surr.)	1	%	86	86
Dibromofluoromethane (surr.)	1	%	116	111
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				
TRH C6-C10	10	Total ug	< 10	< 10
TRH >C10-C16	10	Total ug	< 10	< 10

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Isopropanol	Melbourne	Apr 20, 2018	14 Days
VOCs in Ambient Air by GC/MS	Melbourne	Apr 20, 2018	14 Day
- Method: LTM-ORG-2030 VOCs in Ambient Air by GC/MS			
Total Recoverable Hydrocarbons	Melbourne	Apr 20, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
VOC AIR-TRH (Total Recoverable Hydrocarbons)			
TRH >C10-C16	Melbourne	Apr 20, 2018	7 Day
- Method: MGT 100A			

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Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 53272

Order No.:
Report #: 594882
Phone: 02 8245 0300
Fax:

Received: Apr 18, 2018 12:15 PM
Due: Apr 26, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Isopropanol	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Total Recoverable Hydrocarbons - 2013 NEPM Fractions	VOC AIR-TRH (Total Recoverable Hydrocarbons)	Volatile Organics	VOCs in Ambient Air by GC/MS	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH	Polycyclic Aromatic Hydrocarbons (low level)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	SV11 - FRONT	Apr 17, 2018		Air	M18-Ap23249		X								X			
2	SV11 - BACK	Apr 17, 2018		Air	M18-Ap23250		X								X			
3	SV12 - FRONT	Apr 17, 2018		Air	M18-Ap23251		X								X			
4	SV12 - BACK	Apr 17, 2018		Air	M18-Ap23252		X								X			
5	SV13 - FRONT	Apr 17, 2018		Air	M18-Ap23253		X								X			
6	SV13 - BACK	Apr 17, 2018		Air	M18-Ap23254		X								X			
7	SV14 - FRONT	Apr 17, 2018		Air	M18-Ap23255		X								X			

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
8	SV14 - BACK	Apr 17, 2018		Air	M18-Ap23256		X								X			
9	SV15 - FRONT	Apr 17, 2018		Air	M18-Ap23257		X								X			
10	SV15 - BACK	Apr 17, 2018		Air	M18-Ap23258		X								X			
11	SV16 - FRONT	Apr 17, 2018		Air	M18-Ap23259		X								X			
12	SV16 - BACK	Apr 17, 2018		Air	M18-Ap23260		X								X			
13	SV17 - FRONT	Apr 17, 2018		Air	M18-Ap23261		X								X			
14	SV17 - BACK	Apr 17, 2018		Air	M18-Ap23262		X								X			
15	QC20180417 - FRONT	Apr 17, 2018		Air	M18-Ap23263		X								X			
16	QC20180417 - BACK	Apr 17, 2018		Air	M18-Ap23264		X								X			

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Sample Detail						HOLD	Isopropanol	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Total Recoverable Hydrocarbons - 2013 NEPM Fractions	VOC AIR-TRH (Total Recoverable Hydrocarbons)	Volatile Organics	VOCs in Ambient Air by GC/MS	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH	Polycyclic Aromatic Hydrocarbons (low level)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
17	MB - FRONT	Apr 17, 2018		Air	M18-Ap23265		X						X		X			
18	MB - BACK	Apr 17, 2018		Air	M18-Ap23266		X						X		X			
19	SV14L - FRONT	Apr 17, 2018		Air	M18-Ap23267	X												
20	SV14L - BACK	Apr 17, 2018		Air	M18-Ap23268	X												
21	PSM01	Apr 16, 2018		Water	M18-Ap23269									X			X	
22	PSM02	Apr 16, 2018		Water	M18-Ap23270						X			X		X		
23	PSM03	Apr 16, 2018		Water	M18-Ap23271						X			X		X		
24	JBMW01	Apr 16, 2018		Water	M18-Ap23272						X			X		X		
25	JBMW02	Apr 16, 2018		Water	M18-Ap23273						X			X		X		
26	JBMW03	Apr 16, 2018		Water	M18-Ap23274						X			X		X		
27	JBMW04	Apr 16, 2018		Water	M18-Ap23275						X			X		X		

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Sample Detail						HOLD	Isopropanol	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Total Recoverable Hydrocarbons - 2013 NEPM Fractions	VOC AIR-TRH (Total Recoverable Hydrocarbons)	Volatile Organics	VOCs in Ambient Air by GC/MS	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH	Polycyclic Aromatic Hydrocarbons (low level)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
28	TS	Apr 16, 2018		Water	M18-Ap23276						X							
29	TB	Apr 16, 2018		Water	M18-Ap23277						X							
30	RINS	Apr 16, 2018		Water	M18-Ap23278				X	X	X			X		X		
31	QC20180416	Apr 16, 2018		Water	M18-Ap23279									X			X	
32	QC20180416-1	Apr 16, 2018		Water	M18-Ap23280			X		X		X						X
Test Counts						2	18	1	1	2	9	1	2	9	18	7	2	1

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Isopropanol	Total ug	< 10			10	Pass	
Method Blank							
VOCs in Ambient Air by GC/MS							
Naphthalene	Total ug	< 0.5			0.5	Pass	
1.1-Dichloroethane	Total ug	< 0.5			0.5	Pass	
1.1-Dichloroethene	Total ug	< 0.5			0.5	Pass	
1.1-Dichloropropene	Total ug	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	Total ug	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	Total ug	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	Total ug	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	Total ug	< 0.5			0.5	Pass	
1.2-Dibromo-3-chloropropane	Total ug	< 0.5			0.5	Pass	
1.2-Dibromoethane	Total ug	< 0.5			0.5	Pass	
1.2-Dichloroethane	Total ug	< 0.5			0.5	Pass	
1.2-Dichloropropane	Total ug	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	Total ug	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	Total ug	< 0.5			0.5	Pass	
1.3-Dichloropropane	Total ug	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	Total ug	< 0.5			0.5	Pass	
2-Chlorotoluene	Total ug	< 0.5			0.5	Pass	
2.2-Dichloropropane	Total ug	< 0.5			0.5	Pass	
4-Chlorotoluene	Total ug	< 0.5			0.5	Pass	
Benzene	Total ug	< 0.5			0.5	Pass	
Bromochloromethane	Total ug	< 0.5			0.5	Pass	
Bromodichloromethane	Total ug	< 0.5			0.5	Pass	
Bromoform	Total ug	< 0.5			0.5	Pass	
Carbon Tetrachloride	Total ug	< 0.5			0.5	Pass	
Chlorobenzene	Total ug	< 0.5			0.5	Pass	
Chloroform	Total ug	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	Total ug	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	Total ug	< 0.5			0.5	Pass	
Dibromochloromethane	Total ug	< 0.5			0.5	Pass	
Dibromomethane	Total ug	< 0.5			0.5	Pass	
Ethylbenzene	Total ug	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	Total ug	< 0.5			0.5	Pass	
n-Butylbenzene	Total ug	< 0.5			0.5	Pass	
n-Propylbenzene	Total ug	< 0.5			0.5	Pass	
p-Isopropyltoluene	Total ug	< 0.5			0.5	Pass	
sec-Butylbenzene	Total ug	< 0.5			0.5	Pass	
Styrene	Total ug	< 5			5	Pass	
tert-Butylbenzene	Total ug	< 0.5			0.5	Pass	
Tetrachloroethene	Total ug	< 0.5			0.5	Pass	
Toluene	Total ug	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	Total ug	< 0.5			0.5	Pass	
Trichloroethene	Total ug	< 0.5			0.5	Pass	
Trichlorofluoromethane	Total ug	< 0.5			0.5	Pass	
Vinyl chloride	Total ug	< 0.5			0.5	Pass	
Xylenes - Total	Total ug	< 1.5			1.5	Pass	
1.2-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.2.3-Trichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.2.4-Trichlorobenzene	Total ug	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.3-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
Hexachlorobutadiene	Total ug	< 0.5			0.5	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	Total ug	< 10			10	Pass	
TRH >C10-C16	Total ug	< 10			10	Pass	
LCS - % Recovery							
Isopropanol	%	105			70-130	Pass	
LCS - % Recovery							
VOCs in Ambient Air by GC/MS							
Naphthalene	%	106			70-130	Pass	
1.1-Dichloroethene	%	105			70-130	Pass	
1.1-Dichloropropene	%	96			70-130	Pass	
1.1.1-Trichloroethane	%	95			70-130	Pass	
1.2-Dibromo-3-chloropropane	%	84			75-125	Pass	
1.2-Dichloroethane	%	95			70-130	Pass	
Benzene	%	91			70-130	Pass	
Ethylbenzene	%	88			70-130	Pass	
Toluene	%	88			70-130	Pass	
Trichloroethene	%	92			70-130	Pass	
Xylenes - Total	%	86			70-130	Pass	
1.2-Dichlorobenzene	%	95			70-130	Pass	
1.2.3-Trichlorobenzene	%	109			70-130	Pass	
1.2.4-Trichlorobenzene	%	109			70-130	Pass	
1.4-Dichlorobenzene	%	77			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
TRH C6-C10	%	93			70-130	Pass	
TRH >C10-C16	%	93			70-130	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

JBS & G Australia (NSW) P/L
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Sydney
NSW 2000

Attention: **Rohan Hammond**

Report **594882-W**
Project name PENRITH
Project ID 53272
Received Date Apr 18, 2018

Client Sample ID			**PSM01**	**PSM02**	**PSM03**	**JBMW01**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M18-Ap23269**	**M18-Ap23270**	**M18-Ap23271**	**M18-Ap23272**
Date Sampled			**Apr 16, 2018**	**Apr 16, 2018**	**Apr 16, 2018**	**Apr 16, 2018**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
TRH C6-C10	0.02	mg/L	0.04	0.02	< 0.02	< 0.02
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	0.04	< 0.02	< 0.02	< 0.02
TRH >C10-C16	0.05	mg/L	-	< 0.05	< 0.05	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	-	< 0.05	< 0.05	< 0.05
TRH >C16-C34	0.1	mg/L	-	< 0.1	< 0.1	< 0.1
TRH >C34-C40	0.1	mg/L	-	< 0.1	< 0.1	< 0.1
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	0.04	< 0.02	< 0.02	< 0.02
TRH C10-C14	0.05	mg/L	-	< 0.05	< 0.05	< 0.05
TRH C15-C28	0.1	mg/L	-	< 0.1	< 0.1	< 0.1
TRH C29-C36	0.1	mg/L	-	< 0.1	< 0.1	< 0.1
TRH C10-36 (Total)	0.1	mg/L	-	< 0.1	< 0.1	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Toluene	0.001	mg/L	0.001	0.002	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
4-Bromofluorobenzene (surr.)	1	%	116	111	112	112
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			PSM01	PSM02	PSM03	JBMW01
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M18-Ap23269**	**M18-Ap23270**	**M18-Ap23271**	**M18-Ap23272**
Date Sampled			**Apr 16, 2018**	**Apr 16, 2018**	**Apr 16, 2018**	**Apr 16, 2018**
Test/Reference	LOR	Unit				
Volatile Organics						
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Butanone (MEK)	0.001	mg/L	< 0.001	0.012	< 0.001	< 0.001
2-Propanone (Acetone)	0.001	mg/L	< 0.001	0.010	< 0.001	< 0.001
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromodichloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromoform	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chloroform	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Chloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dichlorodifluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Iodomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Methylene Chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Styrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Tetrachloroethene	0.001	mg/L	0.035	< 0.001	0.007	< 0.001
Toluene	0.001	mg/L	0.001	0.002	< 0.001	< 0.001
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichloroethene	0.001	mg/L	0.001	< 0.001	< 0.001	< 0.001
Trichlorofluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Total MAH*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	0.036	< 0.005	0.007	< 0.005
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	0.036	< 0.005	0.007	< 0.005
4-Bromofluorobenzene (surr.)	1	%	116	111	112	112
Toluene-d8 (surr.)	1	%	99	90	101	100

Client Sample ID			JBMW02	JBMW03	JBMW04	R20TS
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			M18-Ap23273	M18-Ap23274	M18-Ap23275	M18-Ap23276
Date Sampled			Apr 16, 2018	Apr 16, 2018	Apr 16, 2018	Apr 16, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	< 0.01	< 0.01	< 0.01	-
TRH C6-C10	0.02	mg/L	0.15	< 0.02	< 0.02	-
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	0.15	< 0.02	< 0.02	-
TRH >C10-C16	0.05	mg/L	< 0.05	< 0.05	< 0.05	-
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	< 0.05	< 0.05	< 0.05	-
TRH >C16-C34	0.1	mg/L	< 0.1	< 0.1	< 0.1	-
TRH >C34-C40	0.1	mg/L	< 0.1	< 0.1	< 0.1	-
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	0.15	< 0.02	< 0.02	-
TRH C10-C14	0.05	mg/L	< 0.05	< 0.05	< 0.05	-
TRH C15-C28	0.1	mg/L	< 0.1	< 0.1	< 0.1	-
TRH C29-C36	0.1	mg/L	< 0.1	< 0.1	< 0.1	-
TRH C10-36 (Total)	0.1	mg/L	< 0.1	< 0.1	< 0.1	-
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	110
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	97
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	98
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	100
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	100
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	100
4-Bromofluorobenzene (surr.)	1	%	119	110	112	106
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
2-Butanone (MEK)	0.001	mg/L	0.003	< 0.001	< 0.001	-
2-Propanone (Acetone)	0.001	mg/L	< 0.005	< 0.005	< 0.005	-
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Bromodichloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Bromoform	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Bromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-

Client Sample ID			JBMW02	JBMW03	JBMW04	R20TS
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			M18-Ap23273	M18-Ap23274	M18-Ap23275	M18-Ap23276
Date Sampled			Apr 16, 2018	Apr 16, 2018	Apr 16, 2018	Apr 16, 2018
Test/Reference	LOR	Unit				
Volatile Organics						
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Chloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Chloroform	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Chloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
cis-1.2-Dichloroethene	0.001	mg/L	0.002	< 0.001	< 0.001	-
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Dibromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Dichlorodifluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Iodomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Methylene Chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Styrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Tetrachloroethene	0.001	mg/L	0.15	0.004	< 0.001	-
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Trichloroethene	0.001	mg/L	0.009	< 0.001	< 0.001	-
Trichlorofluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	-
Total MAH*	0.003	mg/L	< 0.003	< 0.003	< 0.003	-
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	0.161	< 0.005	< 0.005	-
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	0.161	< 0.005	< 0.005	-
4-Bromofluorobenzene (surr.)	1	%	119	110	112	-
Toluene-d8 (surr.)	1	%	106	95	100	-

Client Sample ID			TB	RINS	QC20180416	QC20180416-1
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			M18-Ap23277	M18-Ap23278	M18-Ap23279	M18-Ap23280
Date Sampled			Apr 16, 2018	Apr 16, 2018	Apr 16, 2018	Apr 16, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.01	mg/L	-	< 0.01	< 0.01	-
TRH C6-C10	0.02	mg/L	-	< 0.02	< 0.02	-
TRH C6-C10 less BTEX (F1)[N04]	0.02	mg/L	-	< 0.02	< 0.02	-
TRH >C10-C16	0.05	mg/L	-	< 0.05	-	< 0.05
TRH >C10-C16 less Naphthalene (F2)[N01]	0.05	mg/L	-	< 0.05	-	-
TRH >C16-C34	0.1	mg/L	-	< 0.1	-	< 0.1
TRH >C34-C40	0.1	mg/L	-	< 0.1	-	< 0.1

Client Sample ID			TB	RINS	QC20180416	QC20180416-1
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			M18-Ap23277	M18-Ap23278	M18-Ap23279	M18-Ap23280
Date Sampled			Apr 16, 2018	Apr 16, 2018	Apr 16, 2018	Apr 16, 2018
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	0.02	mg/L	-	< 0.02	< 0.02	-
TRH C10-C14	0.05	mg/L	-	< 0.05	-	< 0.05
TRH C15-C28	0.1	mg/L	-	< 0.1	-	< 0.1
TRH C29-C36	0.1	mg/L	-	< 0.1	-	< 0.1
TRH C10-36 (Total)	0.1	mg/L	-	< 0.1	-	< 0.1
BTEX						
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	-
4-Bromofluorobenzene (surr.)	1	%	119	122	109	-
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	-	< 0.001	< 0.001	-
1.1-Dichloroethene	0.001	mg/L	-	< 0.001	< 0.001	-
1.1.1-Trichloroethane	0.001	mg/L	-	< 0.001	< 0.001	-
1.1.1.2-Tetrachloroethane	0.001	mg/L	-	< 0.001	< 0.001	-
1.1.2-Trichloroethane	0.001	mg/L	-	< 0.001	< 0.001	-
1.1.2.2-Tetrachloroethane	0.001	mg/L	-	< 0.001	< 0.001	-
1.2-Dibromoethane	0.001	mg/L	-	< 0.001	< 0.001	-
1.2-Dichlorobenzene	0.001	mg/L	-	< 0.001	< 0.001	-
1.2-Dichloroethane	0.001	mg/L	-	< 0.001	< 0.001	-
1.2-Dichloropropane	0.001	mg/L	-	< 0.001	< 0.001	-
1.2.3-Trichloropropane	0.001	mg/L	-	< 0.001	< 0.001	-
1.2.4-Trimethylbenzene	0.001	mg/L	-	< 0.001	< 0.001	-
1.3-Dichlorobenzene	0.001	mg/L	-	< 0.001	< 0.001	-
1.3-Dichloropropane	0.001	mg/L	-	< 0.001	< 0.001	-
1.3.5-Trimethylbenzene	0.001	mg/L	-	< 0.001	< 0.001	-
1.4-Dichlorobenzene	0.001	mg/L	-	< 0.001	< 0.001	-
2-Butanone (MEK)	0.001	mg/L	-	< 0.001	< 0.001	-
2-Propanone (Acetone)	0.001	mg/L	-	< 0.001	< 0.001	-
4-Chlorotoluene	0.001	mg/L	-	< 0.001	< 0.001	-
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	-	< 0.001	< 0.001	-
Allyl chloride	0.001	mg/L	-	< 0.001	< 0.001	-
Benzene	0.001	mg/L	-	< 0.001	< 0.001	-
Bromobenzene	0.001	mg/L	-	< 0.001	< 0.001	-
Bromochloromethane	0.001	mg/L	-	< 0.001	< 0.001	-
Bromodichloromethane	0.001	mg/L	-	< 0.001	< 0.001	-
Bromoform	0.001	mg/L	-	< 0.001	< 0.001	-
Bromomethane	0.001	mg/L	-	< 0.001	< 0.001	-
Carbon disulfide	0.001	mg/L	-	< 0.001	< 0.001	-
Carbon Tetrachloride	0.001	mg/L	-	< 0.001	< 0.001	-
Chlorobenzene	0.001	mg/L	-	< 0.001	< 0.001	-
Chloroethane	0.001	mg/L	-	< 0.001	< 0.001	-
Chloroform	0.005	mg/L	-	< 0.005	< 0.005	-
Chloromethane	0.001	mg/L	-	< 0.001	< 0.001	-
cis-1.2-Dichloroethene	0.001	mg/L	-	< 0.001	< 0.001	-
cis-1.3-Dichloropropene	0.001	mg/L	-	< 0.001	< 0.001	-

Client Sample ID			TB	RINS	QC20180416	QC20180416-1
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M18-Ap23277**	**M18-Ap23278**	**M18-Ap23279**	**M18-Ap23280**
Date Sampled			**Apr 16, 2018**	**Apr 16, 2018**	**Apr 16, 2018**	**Apr 16, 2018**
Test/Reference	LOR	Unit				
Volatile Organics						
Dibromochloromethane	0.001	mg/L	-	< 0.001	< 0.001	-
Dibromomethane	0.001	mg/L	-	< 0.001	< 0.001	-
Dichlorodifluoromethane	0.001	mg/L	-	< 0.001	< 0.001	-
Ethylbenzene	0.001	mg/L	-	< 0.001	< 0.001	-
Iodomethane	0.001	mg/L	-	< 0.001	< 0.001	-
Isopropyl benzene (Cumene)	0.001	mg/L	-	< 0.001	< 0.001	-
m&p-Xylenes	0.002	mg/L	-	< 0.002	< 0.002	-
Methylene Chloride	0.001	mg/L	-	< 0.001	< 0.001	-
o-Xylene	0.001	mg/L	-	< 0.001	< 0.001	-
Styrene	0.001	mg/L	-	< 0.001	< 0.001	-
Tetrachloroethene	0.001	mg/L	-	< 0.001	< 0.001	-
Toluene	0.001	mg/L	-	< 0.001	< 0.001	-
trans-1.2-Dichloroethene	0.001	mg/L	-	< 0.001	< 0.001	-
trans-1.3-Dichloropropene	0.001	mg/L	-	< 0.001	< 0.001	-
Trichloroethene	0.001	mg/L	-	< 0.001	< 0.001	-
Trichlorofluoromethane	0.001	mg/L	-	< 0.001	< 0.001	-
Vinyl chloride	0.001	mg/L	-	< 0.001	< 0.001	-
Xylenes - Total	0.003	mg/L	-	< 0.003	< 0.003	-
Total MAH*	0.003	mg/L	-	< 0.003	< 0.003	-
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	-	< 0.005	< 0.005	-
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	-	< 0.005	< 0.005	-
4-Bromofluorobenzene (surr.)	1	%	-	122	109	-
Toluene-d8 (surr.)	1	%	-	104	98	-
Polycyclic Aromatic Hydrocarbons						
Acenaphthene	0.001	mg/L	-	< 0.001	-	-
Acenaphthylene	0.001	mg/L	-	< 0.001	-	-
Anthracene	0.001	mg/L	-	< 0.001	-	-
Benz(a)anthracene	0.001	mg/L	-	< 0.001	-	-
Benzo(a)pyrene	0.001	mg/L	-	< 0.001	-	-
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	-	< 0.001	-	-
Benzo(g.h.i)perylene	0.001	mg/L	-	< 0.001	-	-
Benzo(k)fluoranthene	0.001	mg/L	-	< 0.001	-	-
Chrysene	0.001	mg/L	-	< 0.001	-	-
Dibenz(a.h)anthracene	0.001	mg/L	-	< 0.001	-	-
Fluoranthene	0.001	mg/L	-	< 0.001	-	-
Fluorene	0.001	mg/L	-	< 0.001	-	-
Indeno(1.2.3-cd)pyrene	0.001	mg/L	-	< 0.001	-	-
Naphthalene	0.001	mg/L	-	< 0.001	-	-
Phenanthrene	0.001	mg/L	-	< 0.001	-	-
Pyrene	0.001	mg/L	-	< 0.001	-	-
Total PAH*	0.001	mg/L	-	< 0.001	-	-
2-Fluorobiphenyl (surr.)	1	%	-	64	-	-
p-Terphenyl-d14 (surr.)	1	%	-	98	-	-
Polycyclic Aromatic Hydrocarbons (low level)						
Acenaphthene	0.00001	mg/L	-	-	-	< 0.00001
Acenaphthylene	0.00001	mg/L	-	-	-	< 0.00001
Anthracene	0.00001	mg/L	-	-	-	< 0.00001
Benz(a)anthracene	0.00001	mg/L	-	-	-	< 0.00001
Benzo(a)pyrene	0.00001	mg/L	-	-	-	< 0.00001

Client Sample ID			TB	RINS	QC20180416	QC20180416-1
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**M18-Ap23277**	**M18-Ap23278**	**M18-Ap23279**	**M18-Ap23280**
Date Sampled			**Apr 16, 2018**	**Apr 16, 2018**	**Apr 16, 2018**	**Apr 16, 2018**
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons (low level)						
Benzo(b&j)fluoranthene	0.00001	mg/L	-	-	-	< 0.00001
Benzo(g.h.i)perylene	0.00001	mg/L	-	-	-	< 0.00001
Benzo(k)fluoranthene	0.00001	mg/L	-	-	-	< 0.00001
Chrysene	0.00001	mg/L	-	-	-	< 0.00001
Dibenz(a.h)anthracene	0.00001	mg/L	-	-	-	< 0.00001
Fluoranthene	0.00001	mg/L	-	-	-	< 0.00001
Fluorene	0.00001	mg/L	-	-	-	< 0.00001
Indeno(1.2.3-cd)pyrene	0.00001	mg/L	-	-	-	< 0.00001
Naphthalene	0.00001	mg/L	-	-	-	< 0.00001
Phenanthrene	0.00001	mg/L	-	-	-	< 0.00001
Pyrene	0.00001	mg/L	-	-	-	< 0.00001
Total PAH*	0.00001	mg/L	-	-	-	< 0.00001
2-Fluorobiphenyl (surr.)	1	%	-	-	-	50
p-Terphenyl-d14 (surr.)	1	%	-	-	-	56
Heavy Metals						
Arsenic	0.001	mg/L	-	< 0.001	-	< 0.001
Cadmium	0.0002	mg/L	-	< 0.0002	-	< 0.0002
Chromium	0.001	mg/L	-	< 0.001	-	< 0.001
Copper	0.001	mg/L	-	< 0.001	-	< 0.001
Lead	0.001	mg/L	-	< 0.001	-	< 0.001
Mercury	0.0001	mg/L	-	< 0.0001	-	< 0.0001
Nickel	0.001	mg/L	-	< 0.001	-	0.034
Zinc	0.005	mg/L	-	< 0.005	-	0.055

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 20, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons	Melbourne	Apr 20, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Melbourne	Apr 20, 2018	7 Day
- Method: LTM-ORG-2010 TRH C6-C36			
BTEX	Melbourne	Apr 20, 2018	14 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Melbourne	Apr 20, 2018	7 Day
- Method: TRH C6-C40 - LTM-ORG-2010			
Volatile Organics	Melbourne	Apr 20, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Polycyclic Aromatic Hydrocarbons	Melbourne	Apr 20, 2018	7 Day
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Polycyclic Aromatic Hydrocarbons (low level)	Melbourne	Apr 20, 2018	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	Apr 20, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
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Project Name: PENRITH
Project ID: 53272

Order No.:
Report #: 594882
Phone: 02 8245 0300
Fax:

Received: Apr 18, 2018 12:15 PM
Due: Apr 26, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Isopropanol	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Total Recoverable Hydrocarbons - 2013 NEPM Fractions	VOC AIR-TRH (Total Recoverable Hydrocarbons)	Volatile Organics	VOCs in Ambient Air by GC/MS	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH	Polycyclic Aromatic Hydrocarbons (low level)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
External Laboratory																		
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**													
1	SV11 - FRONT	Apr 17, 2018		Air	M18-Ap23249		X								X			
2	SV11 - BACK	Apr 17, 2018		Air	M18-Ap23250		X								X			
3	SV12 - FRONT	Apr 17, 2018		Air	M18-Ap23251		X								X			
4	SV12 - BACK	Apr 17, 2018		Air	M18-Ap23252		X								X			
5	SV13 - FRONT	Apr 17, 2018		Air	M18-Ap23253		X								X			
6	SV13 - BACK	Apr 17, 2018		Air	M18-Ap23254		X								X			
7	SV14 - FRONT	Apr 17, 2018		Air	M18-Ap23255		X								X			

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Isopropanol	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Total Recoverable Hydrocarbons - 2013 NEPM Fractions	VOC AIR-TRH (Total Recoverable Hydrocarbons)	Volatile Organics	VOCs in Ambient Air by GC/MS	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH	Polycyclic Aromatic Hydrocarbons (low level)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
8	SV14 - BACK	Apr 17, 2018		Air	M18-Ap23256		X								X			
9	SV15 - FRONT	Apr 17, 2018		Air	M18-Ap23257		X								X			
10	SV15 - BACK	Apr 17, 2018		Air	M18-Ap23258		X								X			
11	SV16 - FRONT	Apr 17, 2018		Air	M18-Ap23259		X								X			
12	SV16 - BACK	Apr 17, 2018		Air	M18-Ap23260		X								X			
13	SV17 - FRONT	Apr 17, 2018		Air	M18-Ap23261		X								X			
14	SV17 - BACK	Apr 17, 2018		Air	M18-Ap23262		X								X			
15	QC20180417 - FRONT	Apr 17, 2018		Air	M18-Ap23263		X								X			
16	QC20180417 - BACK	Apr 17, 2018		Air	M18-Ap23264		X								X			

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Project ID: 53272

Order No.:
Report #: 594882
Phone: 02 8245 0300
Fax:

Received: Apr 18, 2018 12:15 PM
Due: Apr 26, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						HOLD	Isopropanol	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Total Recoverable Hydrocarbons - 2013 NEPM Fractions	VOC AIR-TRH (Total Recoverable Hydrocarbons)	Volatile Organics	VOCs in Ambient Air by GC/MS	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH	Polycyclic Aromatic Hydrocarbons (low level)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
17	MB - FRONT	Apr 17, 2018		Air	M18-Ap23265		X						X		X			
18	MB - BACK	Apr 17, 2018		Air	M18-Ap23266		X						X		X			
19	SV14L - FRONT	Apr 17, 2018		Air	M18-Ap23267	X												
20	SV14L - BACK	Apr 17, 2018		Air	M18-Ap23268	X												
21	PSM01	Apr 16, 2018		Water	M18-Ap23269									X			X	
22	PSM02	Apr 16, 2018		Water	M18-Ap23270						X			X		X		
23	PSM03	Apr 16, 2018		Water	M18-Ap23271						X			X		X		
24	JBMW01	Apr 16, 2018		Water	M18-Ap23272						X			X		X		
25	JBMW02	Apr 16, 2018		Water	M18-Ap23273						X			X		X		
26	JBMW03	Apr 16, 2018		Water	M18-Ap23274						X			X		X		
27	JBMW04	Apr 16, 2018		Water	M18-Ap23275						X			X		X		

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Priority: 5 Day
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Sample Detail						HOLD	Isopropanol	Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Polycyclic Aromatic Hydrocarbons	Metals M8	BTEX	Total Recoverable Hydrocarbons - 2013 NEPM Fractions	VOC AIR-TRH (Total Recoverable Hydrocarbons)	Volatile Organics	VOCs in Ambient Air by GC/MS	Total Recoverable Hydrocarbons	BTEXN and Volatile TRH	Polycyclic Aromatic Hydrocarbons (low level)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																		
Brisbane Laboratory - NATA Site # 20794																		
Perth Laboratory - NATA Site # 23736																		
28	TS	Apr 16, 2018		Water	M18-Ap23276						X							
29	TB	Apr 16, 2018		Water	M18-Ap23277						X							
30	RINS	Apr 16, 2018		Water	M18-Ap23278				X	X	X			X		X		
31	QC20180416	Apr 16, 2018		Water	M18-Ap23279									X			X	
32	QC20180416-1	Apr 16, 2018		Water	M18-Ap23280			X		X		X						X
Test Counts						2	18	1	1	2	9	1	2	9	18	7	2	1

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons (low level)							
Acenaphthene	mg/L	< 0.00001			0.00001	Pass	
Acenaphthylene	mg/L	< 0.00001			0.00001	Pass	
Anthracene	mg/L	< 0.00001			0.00001	Pass	
Benz(a)anthracene	mg/L	< 0.00001			0.00001	Pass	
Benzo(a)pyrene	mg/L	< 0.00001			0.00001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.00001			0.00001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Chrysene	mg/L	< 0.00001			0.00001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.00001			0.00001	Pass	
Fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Fluorene	mg/L	< 0.00001			0.00001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.00001			0.00001	Pass	
Naphthalene	mg/L	< 0.00001			0.00001	Pass	
Phenanthrene	mg/L	< 0.00001			0.00001	Pass	
Pyrene	mg/L	< 0.00001			0.00001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total PAH*	mg/L	< 0.00001			0.00001	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	90			70-130	Pass	
TRH C6-C10	%	109			70-130	Pass	
TRH >C10-C16	%	78			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	112			70-130	Pass	
TRH C10-C14	%	79			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	108			70-130	Pass	
Toluene	%	98			70-130	Pass	
Ethylbenzene	%	89			70-130	Pass	
m&p-Xylenes	%	100			70-130	Pass	
Xylenes - Total	%	98			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	119			70-130	Pass	
1.1.1-Trichloroethane	%	98			70-130	Pass	
1.2-Dichlorobenzene	%	90			70-130	Pass	
1.2-Dichloroethane	%	119			70-130	Pass	
Trichloroethene	%	97			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	113			70-130	Pass	
Acenaphthylene	%	127			70-130	Pass	
Anthracene	%	112			70-130	Pass	
Benz(a)anthracene	%	102			70-130	Pass	
Benzo(a)pyrene	%	102			70-130	Pass	
Benzo(b&j)fluoranthene	%	100			70-130	Pass	
Benzo(g.h.i)perylene	%	91			70-130	Pass	
Benzo(k)fluoranthene	%	103			70-130	Pass	
Chrysene	%	98			70-130	Pass	
Dibenz(a.h)anthracene	%	84			70-130	Pass	
Fluoranthene	%	94			70-130	Pass	
Fluorene	%	106			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	84			70-130	Pass	
Naphthalene	%	105			70-130	Pass	
Phenanthrene	%	124			70-130	Pass	
Pyrene	%	95			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons (low level)							

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthene	%	113			70-130	Pass	
Acenaphthylene	%	127			70-130	Pass	
Anthracene	%	112			70-130	Pass	
Benz(a)anthracene	%	102			70-130	Pass	
Benzo(a)pyrene	%	102			70-130	Pass	
Benzo(b&j)fluoranthene	%	100			70-130	Pass	
Benzo(g.h.i)perylene	%	91			70-130	Pass	
Benzo(k)fluoranthene	%	103			70-130	Pass	
Chrysene	%	98			70-130	Pass	
Dibenz(a.h)anthracene	%	84			70-130	Pass	
Fluoranthene	%	94			70-130	Pass	
Fluorene	%	106			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	84			70-130	Pass	
Naphthalene	%	105			70-130	Pass	
Phenanthrene	%	124			70-130	Pass	
Pyrene	%	95			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	114			80-120	Pass	
Cadmium	%	86			80-120	Pass	
Chromium	%	97			80-120	Pass	
Copper	%	105			80-120	Pass	
Lead	%	102			80-120	Pass	
Mercury	%	90			75-125	Pass	
Nickel	%	106			80-120	Pass	
Zinc	%	110			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Ap22705	NCP	%	107			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-Ap22705	NCP	%	107			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	A18-Ap19778	NCP	%	104			70-130	Pass	
Acenaphthylene	A18-Ap19778	NCP	%	83			70-130	Pass	
Anthracene	A18-Ap19778	NCP	%	86			70-130	Pass	
Benz(a)anthracene	A18-Ap19778	NCP	%	75			70-130	Pass	
Benzo(a)pyrene	A18-Ap19778	NCP	%	79			70-130	Pass	
Benzo(b&j)fluoranthene	A18-Ap19778	NCP	%	122			70-130	Pass	
Benzo(g.h.i)perylene	A18-Ap19778	NCP	%	71			70-130	Pass	
Benzo(k)fluoranthene	A18-Ap19778	NCP	%	121			70-130	Pass	
Chrysene	A18-Ap19778	NCP	%	77			70-130	Pass	
Dibenz(a.h)anthracene	A18-Ap19778	NCP	%	70			70-130	Pass	
Fluoranthene	A18-Ap19778	NCP	%	94			70-130	Pass	
Fluorene	A18-Ap19778	NCP	%	74			70-130	Pass	
Indeno(1.2.3-cd)pyrene	A18-Ap19778	NCP	%	77			70-130	Pass	
Naphthalene	A18-Ap19778	NCP	%	int			70-130	Fail	
Phenanthrene	A18-Ap19778	NCP	%	106			70-130	Pass	
Pyrene	A18-Ap19778	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Ap23278	CP	%	111			75-125	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Cadmium	M18-Ap23278	CP	%	99			75-125	Pass	
Chromium	M18-Ap23278	CP	%	103			75-125	Pass	
Copper	M18-Ap23278	CP	%	109			75-125	Pass	
Lead	M18-Ap23278	CP	%	109			75-125	Pass	
Mercury	M18-Ap23278	CP	%	96			70-130	Pass	
Nickel	M18-Ap23278	CP	%	110			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (low level)				Result 1					
Acenaphthene	M18-Ap19847	NCP	%	73			70-130	Pass	
Acenaphthylene	M18-Ap19847	NCP	%	74			70-130	Pass	
Anthracene	M18-Ap19847	NCP	%	83			70-130	Pass	
Benz(a)anthracene	M18-Ap19847	NCP	%	77			70-130	Pass	
Benzo(a)pyrene	M18-Ap19847	NCP	%	83			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Ap19847	NCP	%	77			70-130	Pass	
Benzo(g.h.i)perylene	M18-Ap19847	NCP	%	82			70-130	Pass	
Benzo(k)fluoranthene	M18-Ap19847	NCP	%	74			70-130	Pass	
Chrysene	M18-Ap19847	NCP	%	95			70-130	Pass	
Dibenz(a.h)anthracene	M18-Ap19847	NCP	%	71			70-130	Pass	
Fluoranthene	M18-Ap19847	NCP	%	76			70-130	Pass	
Fluorene	M18-Ap19847	NCP	%	71			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ap19847	NCP	%	76			70-130	Pass	
Naphthalene	M18-Ap19847	NCP	%	70			70-130	Pass	
Phenanthrene	M18-Ap19847	NCP	%	79			70-130	Pass	
Pyrene	M18-Ap19847	NCP	%	79			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	A18-Ap19777	NCP	mg/L	13	18	31	30%	Fail	Q02
TRH >C16-C34	A18-Ap19777	NCP	mg/L	0.3	0.5	41	30%	Fail	Q15
TRH >C34-C40	A18-Ap19777	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	A18-Ap19777	NCP	mg/L	20	28	31	30%	Fail	Q02
TRH C15-C28	A18-Ap19777	NCP	mg/L	0.7	1.1	39	30%	Fail	Q15
TRH C29-C36	A18-Ap19777	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ap23278	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	M18-Ap23278	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M18-Ap23278	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	M18-Ap23278	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	M18-Ap23278	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	M18-Ap23278	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	M18-Ap23278	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	M18-Ap23278	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (low level)				Result 1	Result 2	RPD			
Acenaphthene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Acenaphthylene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Anthracene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benz(a)anthracene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(a)pyrene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Chrysene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Fluoranthene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Fluorene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Naphthalene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Phenanthrene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Pyrene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q02	The duplicate %RPD is outside the recommended acceptance criteria. Further analysis indicates sample heterogeneity as the cause
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

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Harry Bacalis	Senior Analyst-Volatile (VIC)
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Glenn Jackson

National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

DRAFT

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/L	< 0.01			0.01	Pass	
TRH C6-C10	mg/L	< 0.02			0.02	Pass	
TRH >C10-C16	mg/L	< 0.05			0.05	Pass	
TRH >C16-C34	mg/L	< 0.1			0.1	Pass	
TRH >C34-C40	mg/L	< 0.1			0.1	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/L	< 0.02			0.02	Pass	
TRH C10-C14	mg/L	< 0.05			0.05	Pass	
TRH C15-C28	mg/L	< 0.1			0.1	Pass	
TRH C29-C36	mg/L	< 0.1			0.1	Pass	
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	

DRAFT

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benz(a)anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons (low level)							
Acenaphthene	mg/L	< 0.00001			0.00001	Pass	
Acenaphthylene	mg/L	< 0.00001			0.00001	Pass	
Anthracene	mg/L	< 0.00001			0.00001	Pass	
Benz(a)anthracene	mg/L	< 0.00001			0.00001	Pass	
Benzo(a)pyrene	mg/L	< 0.00001			0.00001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.00001			0.00001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Chrysene	mg/L	< 0.00001			0.00001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.00001			0.00001	Pass	
Fluoranthene	mg/L	< 0.00001			0.00001	Pass	
Fluorene	mg/L	< 0.00001			0.00001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.00001			0.00001	Pass	
Naphthalene	mg/L	< 0.00001			0.00001	Pass	
Phenanthrene	mg/L	< 0.00001			0.00001	Pass	
Pyrene	mg/L	< 0.00001			0.00001	Pass	

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Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total PAH*	mg/L	< 0.00001			0.00001	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	90			70-130	Pass	
TRH C6-C10	%	109			70-130	Pass	
TRH >C10-C16	%	78			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	112			70-130	Pass	
TRH C10-C14	%	79			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	108			70-130	Pass	
Toluene	%	98			70-130	Pass	
Ethylbenzene	%	89			70-130	Pass	
m&p-Xylenes	%	100			70-130	Pass	
Xylenes - Total	%	98			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	119			70-130	Pass	
1.1.1-Trichloroethane	%	98			70-130	Pass	
1.2-Dichlorobenzene	%	90			70-130	Pass	
1.2-Dichloroethane	%	119			70-130	Pass	
Trichloroethene	%	97			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	113			70-130	Pass	
Acenaphthylene	%	127			70-130	Pass	
Anthracene	%	112			70-130	Pass	
Benz(a)anthracene	%	102			70-130	Pass	
Benzo(a)pyrene	%	102			70-130	Pass	
Benzo(b&j)fluoranthene	%	100			70-130	Pass	
Benzo(g.h.i)perylene	%	91			70-130	Pass	
Benzo(k)fluoranthene	%	103			70-130	Pass	
Chrysene	%	98			70-130	Pass	
Dibenz(a.h)anthracene	%	84			70-130	Pass	
Fluoranthene	%	94			70-130	Pass	
Fluorene	%	106			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	84			70-130	Pass	
Naphthalene	%	105			70-130	Pass	
Phenanthrene	%	124			70-130	Pass	
Pyrene	%	95			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons (low level)							

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Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Acenaphthene	%	113			70-130	Pass	
Acenaphthylene	%	127			70-130	Pass	
Anthracene	%	112			70-130	Pass	
Benz(a)anthracene	%	102			70-130	Pass	
Benzo(a)pyrene	%	102			70-130	Pass	
Benzo(b&j)fluoranthene	%	100			70-130	Pass	
Benzo(g.h.i)perylene	%	91			70-130	Pass	
Benzo(k)fluoranthene	%	103			70-130	Pass	
Chrysene	%	98			70-130	Pass	
Dibenz(a.h)anthracene	%	84			70-130	Pass	
Fluoranthene	%	94			70-130	Pass	
Fluorene	%	106			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	84			70-130	Pass	
Naphthalene	%	105			70-130	Pass	
Phenanthrene	%	124			70-130	Pass	
Pyrene	%	95			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	114			80-120	Pass	
Cadmium	%	86			80-120	Pass	
Chromium	%	97			80-120	Pass	
Copper	%	105			80-120	Pass	
Lead	%	102			80-120	Pass	
Mercury	%	90			75-125	Pass	
Nickel	%	106			80-120	Pass	
Zinc	%	110			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
TRH >C10-C16	M18-Ap22705	NCP	%	107			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C10-C14	M18-Ap22705	NCP	%	107			70-130	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	A18-Ap19778	NCP	%	104			70-130	Pass	
Acenaphthylene	A18-Ap19778	NCP	%	83			70-130	Pass	
Anthracene	A18-Ap19778	NCP	%	86			70-130	Pass	
Benz(a)anthracene	A18-Ap19778	NCP	%	75			70-130	Pass	
Benzo(a)pyrene	A18-Ap19778	NCP	%	79			70-130	Pass	
Benzo(b&j)fluoranthene	A18-Ap19778	NCP	%	122			70-130	Pass	
Benzo(g.h.i)perylene	A18-Ap19778	NCP	%	71			70-130	Pass	
Benzo(k)fluoranthene	A18-Ap19778	NCP	%	121			70-130	Pass	
Chrysene	A18-Ap19778	NCP	%	77			70-130	Pass	
Dibenz(a.h)anthracene	A18-Ap19778	NCP	%	70			70-130	Pass	
Fluoranthene	A18-Ap19778	NCP	%	94			70-130	Pass	
Fluorene	A18-Ap19778	NCP	%	74			70-130	Pass	
Indeno(1.2.3-cd)pyrene	A18-Ap19778	NCP	%	77			70-130	Pass	
Naphthalene	A18-Ap19778	NCP	%	m/i			70-130	Fail	Q08
Phenanthrene	A18-Ap19778	NCP	%	106			70-130	Pass	
Pyrene	A18-Ap19778	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Ap23278	CP	%	111			75-125	Pass	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Cadmium	M18-Ap23278	CP	%	99			75-125	Pass	
Chromium	M18-Ap23278	CP	%	103			75-125	Pass	
Copper	M18-Ap23278	CP	%	109			75-125	Pass	
Lead	M18-Ap23278	CP	%	109			75-125	Pass	
Mercury	M18-Ap23278	CP	%	96			70-130	Pass	
Nickel	M18-Ap23278	CP	%	110			75-125	Pass	
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (low level)				Result 1					
Acenaphthene	M18-Ap19847	NCP	%	73			70-130	Pass	
Acenaphthylene	M18-Ap19847	NCP	%	74			70-130	Pass	
Anthracene	M18-Ap19847	NCP	%	83			70-130	Pass	
Benz(a)anthracene	M18-Ap19847	NCP	%	77			70-130	Pass	
Benzo(a)pyrene	M18-Ap19847	NCP	%	83			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Ap19847	NCP	%	77			70-130	Pass	
Benzo(g.h.i)perylene	M18-Ap19847	NCP	%	82			70-130	Pass	
Benzo(k)fluoranthene	M18-Ap19847	NCP	%	74			70-130	Pass	
Chrysene	M18-Ap19847	NCP	%	95			70-130	Pass	
Dibenz(a.h)anthracene	M18-Ap19847	NCP	%	71			70-130	Pass	
Fluoranthene	M18-Ap19847	NCP	%	76			70-130	Pass	
Fluorene	M18-Ap19847	NCP	%	71			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ap19847	NCP	%	76			70-130	Pass	
Naphthalene	M18-Ap19847	NCP	%	70			70-130	Pass	
Phenanthrene	M18-Ap19847	NCP	%	79			70-130	Pass	
Pyrene	M18-Ap19847	NCP	%	79			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
TRH >C10-C16	A18-Ap19777	NCP	mg/L	13	18	31	30%	Fail	Q15
TRH >C16-C34	A18-Ap19777	NCP	mg/L	0.3	0.5	41	30%	Fail	Q15
TRH >C34-C40	A18-Ap19777	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C10-C14	A18-Ap19777	NCP	mg/L	20	28	31	30%	Fail	Q15
TRH C15-C28	A18-Ap19777	NCP	mg/L	0.7	1.1	39	30%	Fail	Q15
TRH C29-C36	A18-Ap19777	NCP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Acenaphthylene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Anthracene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benz(a)anthracene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(a)pyrene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Chrysene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluoranthene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Fluorene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Naphthalene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Phenanthrene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Pyrene	M18-Ap22446	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	

Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ap23278	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Cadmium	M18-Ap23278	CP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M18-Ap23278	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	M18-Ap23278	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Lead	M18-Ap23278	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Mercury	M18-Ap23278	CP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	M18-Ap23278	CP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Zinc	M18-Ap23278	CP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Duplicate									
Polycyclic Aromatic Hydrocarbons (low level)				Result 1	Result 2	RPD			
Acenaphthene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Acenaphthylene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Anthracene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benz(a)anthracene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(a)pyrene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Chrysene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Fluoranthene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Fluorene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Naphthalene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Phenanthrene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	
Pyrene	M18-Ap22446	NCP	mg/L	< 0.00001	< 0.00001	<1	30%	Pass	

DRAFT

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q08	The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference
Q15	The RPD reported passes Eurofins | mgt's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Harry Bacallis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson
National Operations Manager

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

DRAFT

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Enviro Sample Vic

From: Asim Khan
Sent: Friday, 27 April 2018 6:28 PM
To: Enviro Sample Vic
Cc: Nibha Vaidya
Subject: ADDITIONAL ANALYSIS FW: Eurofins | mgt Test Results - Report 594882 : Site PENRITH (53272)

Importance: High

Additional analysis please on 1 DAY TAT

Kind regards,

Asim Khan
Analytical Services Manager

Eurofins | mgt
Phone : +61 2 9900 8432
Email : AsimKhan@eurofins.com
Website : www.eurofins.com.au/environmental-testing

Will O'Haire
595919

From: Rohan Hammond [mailto:RHammond@jbsg.com.au]
Sent: Friday, 27 April 2018 6:12 PM
To: Asim Khan
Subject: Re: Eurofins | mgt Test Results - Report 594882 : Site PENRITH (53272)

EXTERNAL EMAIL*

AA
4xV UF

ds 16/4

Thanks Asim,

I understand that the Air results are to be delivered Monday morning.

Ap 23274

Can you please also schedule sample JBMW03 for low level PAHs and 8 metals?

Kind Regards,
Rohan Hammond

Rohan Hammond | Environmental Consultant | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane
Level 1, 50 Margaret Street Sydney NSW 2000
T: 02 8245 0300 | M: 0430 379 445 | www.jbsg.com.au
Contaminated Land | Groundwater Remediation | Auditing and Compliance | Assessments and Approvals | Occupational Hygiene and Monitoring

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---

From: AsimKhan@eurofins.com <AsimKhan@eurofins.com>
Sent: 27 April 2018 16:17:23
To: Rohan Hammond
Subject: Eurofins | mgt Test Results - Report 594882 : Site PENRITH (53272)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Melbourne
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NATA # 1261
Site # 1254 & 14271

Sydney
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Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Rohan Hammond
Project name: PENRITH
Project ID: 53272
COC number: Not provided
Turn around time: 3 Day
Date/Time received: Apr 27, 2018 4:30 PM
Eurofins | mgt reference: **595919**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8400 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Rohan Hammond - rhammond@jbsg.com.au.

Note: A copy of these results will also be delivered to the general JBS & G Australia (NSW) P/L email address.

ABN– 50 005 085 521
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web : www.eurofins.com.au

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NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	JBS & G Australia (NSW) P/L	**Order No.:**		**Received:**	Apr 27, 2018 4:30 PM
Address:	Level 1, 50 Margaret St Sydney NSW 2000	**Report #:**	595919	**Due:**	May 2, 2018
		Phone:	02 8245 0300	**Priority:**	3 Day
		Fax:		**Contact Name:**	Rohan Hammond
Project Name:	PENRITH				
Project ID:	53272				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Metals M8	Polycyclic Aromatic Hydrocarbons (low level)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	JBMW03	Apr 16, 2018		Water	M18-Ap31975	X	X
Test Counts						1	1

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 1254

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **595919-W**
Project name PENRITH
Project ID 53272
Received Date Apr 27, 2018

Client Sample ID			**JBMW03**
Sample Matrix			**Water**
Eurofins | mgt Sample No.			**M18-Ap31975**
Date Sampled			**Apr 16, 2018**
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons (low level)			
Acenaphthene	0.00001	mg/L	< 0.00001
Acenaphthylene	0.00001	mg/L	< 0.00001
Anthracene	0.00001	mg/L	< 0.00001
Benz(a)anthracene	0.00001	mg/L	< 0.00001
Benzo(a)pyrene	0.00001	mg/L	< 0.00001
Benzo(b&j)fluoranthene	0.00001	mg/L	< 0.00001
Benzo(g.h.i)perylene	0.00001	mg/L	< 0.00001
Benzo(k)fluoranthene	0.00001	mg/L	< 0.00001
Chrysene	0.00001	mg/L	< 0.00001
Dibenz(a.h)anthracene	0.00001	mg/L	< 0.00001
Fluoranthene	0.00001	mg/L	< 0.00001
Fluorene	0.00001	mg/L	< 0.00001
Indeno(1.2.3-cd)pyrene	0.00001	mg/L	< 0.00001
Naphthalene	0.00001	mg/L	< 0.00001
Phenanthrene	0.00001	mg/L	< 0.00001
Pyrene	0.00001	mg/L	< 0.00001
Total PAH*	0.00001	mg/L	< 0.00001
2-Fluorobiphenyl (surr.)	1	%	82
p-Terphenyl-d14 (surr.)	1	%	109
Heavy Metals			
Arsenic	0.001	mg/L	0.024
Cadmium	0.0002	mg/L	< 0.0002
Chromium	0.001	mg/L	< 0.001
Copper	0.001	mg/L	< 0.001
Lead	0.001	mg/L	< 0.001
Mercury	0.0001	mg/L	< 0.0001
Nickel	0.001	mg/L	0.027
Zinc	0.005	mg/L	0.050

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Polycyclic Aromatic Hydrocarbons (low level)	Melbourne	Apr 27, 2018	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Melbourne	Apr 27, 2018	28 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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NATA # 1261
Site # 23736

Company Name:	JBS & G Australia (NSW) P/L	**Order No.:**		**Received:**	Apr 27, 2018 4:30 PM
Address:	Level 1, 50 Margaret St Sydney NSW 2000	**Report #:**	595919	**Due:**	May 2, 2018
		Phone:	02 8245 0300	**Priority:**	3 Day
		Fax:		**Contact Name:**	Rohan Hammond
Project Name:	PENRITH				
Project ID:	53272				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Metals M8	Polycyclic Aromatic Hydrocarbons (low level)
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	JBMW03	Apr 16, 2018		Water	M18-Ap31975	X	X
Test Counts						1	1

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.001			0.001	Pass	
Cadmium	mg/L	< 0.0002			0.0002	Pass	
Chromium	mg/L	< 0.001			0.001	Pass	
Copper	mg/L	< 0.001			0.001	Pass	
Lead	mg/L	< 0.001			0.001	Pass	
Mercury	mg/L	< 0.0001			0.0001	Pass	
Nickel	mg/L	< 0.001			0.001	Pass	
Zinc	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons (low level)							
Acenaphthene	%	99			70-130	Pass	
Acenaphthylene	%	105			70-130	Pass	
Anthracene	%	127			70-130	Pass	
Benz(a)anthracene	%	110			70-130	Pass	
Benzo(a)pyrene	%	115			70-130	Pass	
Benzo(b&j)fluoranthene	%	106			70-130	Pass	
Benzo(g.h.i)perylene	%	95			70-130	Pass	
Benzo(k)fluoranthene	%	127			70-130	Pass	
Chrysene	%	120			70-130	Pass	
Dibenz(a.h)anthracene	%	112			70-130	Pass	
Fluoranthene	%	115			70-130	Pass	
Fluorene	%	111			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	108			70-130	Pass	
Naphthalene	%	99			70-130	Pass	
Phenanthrene	%	113			70-130	Pass	
Pyrene	%	122			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	108			80-120	Pass	
Cadmium	%	103			80-120	Pass	
Chromium	%	103			80-120	Pass	
Copper	%	100			80-120	Pass	
Lead	%	111			80-120	Pass	
Mercury	%	100			75-125	Pass	
Nickel	%	101			80-120	Pass	
Zinc	%	103			80-120	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons (low level)				Result 1					
Acenaphthene	M18-Ap30384	NCP	%	96			70-130	Pass	
Acenaphthylene	M18-Ap30384	NCP	%	109			70-130	Pass	
Anthracene	M18-Ap30384	NCP	%	111			70-130	Pass	
Benz(a)anthracene	M18-Ap30384	NCP	%	121			70-130	Pass	
Benzo(a)pyrene	M18-Ap30384	NCP	%	120			70-130	Pass	
Benzo(b&j)fluoranthene	M18-Ap30384	NCP	%	103			70-130	Pass	
Benzo(g.h.i)perylene	M18-Ap30384	NCP	%	88			70-130	Pass	
Benzo(k)fluoranthene	M18-Ap30384	NCP	%	129			70-130	Pass	
Chrysene	M18-Ap30384	NCP	%	123			70-130	Pass	
Dibenz(a.h)anthracene	M18-Ap30384	NCP	%	104			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Fluoranthene	M18-Ap30384	NCP	%	125			70-130	Pass	
Fluorene	M18-Ap30384	NCP	%	110			70-130	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ap30384	NCP	%	100			70-130	Pass	
Naphthalene	M18-Ap30384	NCP	%	107			70-130	Pass	
Phenanthrene	M18-Ap30384	NCP	%	105			70-130	Pass	
Pyrene	M18-Ap30384	NCP	%	121			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	M18-Ap30690	NCP	%	89			75-125	Pass	
Cadmium	M18-Ap30690	NCP	%	77			75-125	Pass	
Chromium	M18-Ap30690	NCP	%	94			75-125	Pass	
Copper	M18-Ap30690	NCP	%	107			75-125	Pass	
Lead	M18-Ap30690	NCP	%	97			75-125	Pass	
Mercury	M18-Ap30690	NCP	%	90			70-130	Pass	
Nickel	M18-Ap30690	NCP	%	86			75-125	Pass	
Zinc	M18-Ap30690	NCP	%	110			75-125	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Polycyclic Aromatic Hydrocarbons (low level)				Result 1	Result 2	RPD			
Acenaphthene	M18-Ap30383	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Acenaphthylene	M18-Ap30383	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Anthracene	M18-Ap30383	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Benz(a)anthracene	M18-Ap30383	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Benzo(a)pyrene	M18-Ap30383	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Benzo(b&j)fluoranthene	M18-Ap30383	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Benzo(g.h.i)perylene	M18-Ap30383	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Benzo(k)fluoranthene	M18-Ap30383	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Chrysene	M18-Ap30383	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Dibenz(a.h)anthracene	M18-Ap30383	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Fluoranthene	M18-Ap30383	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Fluorene	M18-Ap30383	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	M18-Ap30383	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Naphthalene	M18-Ap30383	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Phenanthrene	M18-Ap30383	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Pyrene	M18-Ap30383	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	M18-Ap30690	NCP	mg/L	0.002	0.002	9.0	30%	Pass	
Cadmium	M18-Ap30690	NCP	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium	M18-Ap30690	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Copper	M18-Ap30690	NCP	mg/L	0.56	0.56	<1	30%	Pass	
Lead	M18-Ap30690	NCP	mg/L	0.014	0.014	2.0	30%	Pass	
Mercury	M18-Ap30690	NCP	mg/L	< 0.0001	< 0.0001	<1	30%	Pass	
Nickel	M18-Ap30690	NCP	mg/L	0.007	0.007	3.0	30%	Pass	
Zinc	M18-Ap30690	NCP	mg/L	0.16	0.16	4.0	30%	Pass	

016612

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 55073
PROJECT NAME: Penrith
DATE NEEDED BY: ST TAT

LABORATORY BATCH NO.:
SAMPLERS: CB
QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) rhammond@jbsg.com.au; (3) chemeth@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Hold	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
MWSV 0.3-0.4	Soil	5.11.18		J+B		X			
0.5-0.6				↓					
0.9-1.0				↓					
1.9-2.0				J					
2.9-3.0				↓					
3.9-4.0				↓					
4.9-5.0				↓					
5.9-6.0				↓					
6.9-7.0				J+S					
7.9-8.0				J+B					
TS	Water			Vials					
TB									
Rinsate				Amber, Metal, Vials					

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: CB DATE: 5/11/18	CONSIGNMENT NOTE NO.	NAME: RJM DATE: 5/11/18 5:39	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	OF:	COOLER TEMP ..... deg C 3.5°C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody - Generic

#626517

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Enviro Sample NSW

To: Nibha Vaidya
Subject: RE: 55073 - Penrith

-------- Original message --------
From: Rohan Hammond <RHammond@jbsg.com.au>
Date: 7/11/18 1:44 pm (GMT+10:00)
To: Charl Du Preez <CharlDuPreez@eurofins.com>, Nibha Vaidya <NibhaVaidya@eurofins.com>
Subject: 55073 - Penrith

EXTERNAL EMAIL*

Hi guys,

For the lab batch submitted to you on Monday, can you please schedule:

Total organic carbon fraction on MWSV 6.9-7.0 and MWSV 7.9-8.0.

Rohan.

Rohan Hammond | Environmental Consultant | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane | Canberra | Darwin | Wollongong
Level 1, 50 Margaret Street Sydney NSW 2000
T: 02 8245 0300 | M: 0430 379 445| E: rhammond@jbsg.com.au | W: www.jbsg.com.au
Contaminated Land | Groundwater Remediation | Auditing and Compliance | Assessments and Approvals | Occupational Hygiene and Monitoring

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NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Rohan Hammond
Project name: PENRITH
Project ID: 55073
COC number: Not provided
Turn around time: 5 Day
Date/Time received: Nov 7, 2018 5:39 PM
Eurofins | mgt reference: **626517**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 3.6 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Samples TS (x2 vials) received broken. Sample TB (1 vial) received broken.

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Rohan Hammond - rhammond@jbsg.com.au.

Note: A copy of these results will also be delivered to the general JBS & G Australia (NSW) P/L email address.

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NATA # 1261
Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 55073

Order No.:
Report #: 626517
Phone: 02 8245 0300
Fax:

Received: Nov 7, 2018 5:39 PM
Due: Nov 14, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						CANCELLED	HOLD	Total Organic Carbon	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	MWSV 0.3-0.4	Nov 05, 2018		Soil	S18-No09069		X		
2	MWSV 0.5-0.6	Nov 05, 2018		Soil	S18-No09070		X		
3	MWSV 0.9-1.0	Nov 05, 2018		Soil	S18-No09071		X		
4	MWSV 1.9-2.0	Nov 05, 2018		Soil	S18-No09072		X		
5	MWSV 2.9-3.0	Nov 05, 2018		Soil	S18-No09073		X		
6	MWSV 3.9-4.0	Nov 05, 2018		Soil	S18-No09074		X		
7	MWSV 4.9-5.0	Nov 05, 2018		Soil	S18-No09075		X		
8	MWSV 5.9-6.0	Nov 05, 2018		Soil	S18-No09076		X		
9	MWSV 6.9-7.0	Nov 05, 2018		Soil	S18-No09077			X	X

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web : www.eurofins.com.au

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
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Order No.:
Report #: 626517
Phone: 02 8245 0300
Fax:

Received: Nov 7, 2018 5:39 PM
Due: Nov 14, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						CANCELLED	HOLD	Total Organic Carbon	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
10	MWSV 7.9-8.0	Nov 05, 2018		Soil	S18-No09078			X	X
11	TS	Nov 05, 2018		Water	S18-No09079	X			
12	TB	Nov 05, 2018		Water	S18-No09080		X		
13	RINSATE	Nov 05, 2018		Water	S18-No09081		X		
Test Counts						1	10	2	2

eurofins | mgt

30 years Testing For Life 1987–2017
Celebrating 30 years Testing and Protecting Human Health

Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

Attention: **Rohan Hammond**

Report **626517-S**
Project name PENRITH
Project ID 55073
Received Date Nov 07, 2018

Client Sample ID			**MWSV 6.9-7.0**	**MWSV 7.9-8.0**
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No09077**	**S18-No09078**
Date Sampled			**Nov 05, 2018**	**Nov 05, 2018**
Test/Reference	LOR	Unit		
Total Organic Carbon	0.1	%	0.1	0.4
% Moisture	1	%	11	11

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Organic Carbon	Melbourne	Nov 12, 2018	28 Day
- Method: APHA 5310B Total Organic Carbon			
% Moisture	Melbourne	Nov 08, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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Version: 1, Version Date: 14/04/2021

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Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 55073

Order No.:
Report #: 626517
Phone: 02 8245 0300
Fax:

Received: Nov 7, 2018 5:39 PM
Due: Nov 14, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						CANCELLED	HOLD	Total Organic Carbon	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	MWSV 0.3-0.4	Nov 05, 2018		Soil	S18-No09069		X		
2	MWSV 0.5-0.6	Nov 05, 2018		Soil	S18-No09070		X		
3	MWSV 0.9-1.0	Nov 05, 2018		Soil	S18-No09071		X		
4	MWSV 1.9-2.0	Nov 05, 2018		Soil	S18-No09072		X		
5	MWSV 2.9-3.0	Nov 05, 2018		Soil	S18-No09073		X		
6	MWSV 3.9-4.0	Nov 05, 2018		Soil	S18-No09074		X		
7	MWSV 4.9-5.0	Nov 05, 2018		Soil	S18-No09075		X		
8	MWSV 5.9-6.0	Nov 05, 2018		Soil	S18-No09076		X		
9	MWSV 6.9-7.0	Nov 05, 2018		Soil	S18-No09077			X	X

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NATA # 1261
Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 55073

Order No.:
Report #: 626517
Phone: 02 8245 0300
Fax:

Received: Nov 7, 2018 5:39 PM
Due: Nov 14, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						CANCELLED	HOLD	Total Organic Carbon	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
10	MWSV 7.9-8.0	Nov 05, 2018		Soil	S18-No09078			X	X
11	TS	Nov 05, 2018		Water	S18-No09079	X			
12	TB	Nov 05, 2018		Water	S18-No09080		X		
13	RINSATE	Nov 05, 2018		Water	S18-No09081		X		
Test Counts						1	10	2	2

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Organic Carbon	%	< 0.1			0.1	Pass	
LCS - % Recovery							
Total Organic Carbon	%	91			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Total Organic Carbon	S18-No09077	CP	%	0.1	0.2	21	30%	Pass	
% Moisture	S18-No09099	NCP	%	15	15	2.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Nibha Vaidya	Analytical Services Manager
Julie Kay	Senior Analyst-Inorganic (VIC)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

016621

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 55073
PROJECT NAME: Penrith
DATE NEEDED BY: Std TAT
LABORATORY BATCH NO.:
SAMPLERS: CB
QC LEVEL: NEPM (2013)
PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688
SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) Rhammond@jbsg.com.au; (3) cbennett@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

627998

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	VOC 8260	VOCs	MNA *	BTEX	Isopropanol	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
JBMW02	Water	15.11.18		8x Vial, 1x plastic, 1x glass, 1x Ferrous Iron			X	X					*
JBMW05	↓	↓		↓			X	X					Sulfate
DSM01							X	X					Nitrate
QA151118							X	X					chloride
RIN151118				2xV, 1xM, 1xA			X						Ferrous Iron
SV18	Carbon			Carbon tube		X				X			Methane
SV19	↓			↓		X				X			Ethene
QA-V	↓			↓		X				X			Ethane
TS	water			Vials					X				pH
TB	water	↓		Vials					X				TOC
MB	Carbon	↓		carbon tube		X				X			Alkalinity

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: CB DATE: 15.11.18	CONSIGNMENT NOTE NO.	NAME: Elvis DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	OF:	COOLER TEMP 5.23 deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody - Generic

Document Set ID: 9547379
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Melbourne
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Oakleigh Vic 3166
Phone : +61 3 8564 5000
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Site # 1254 & 14271

Sydney
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16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Rohan Hammond
Project name: PENRITH
Project ID: 55073
COC number: 016621
Turn around time: 5 Day
Date/Time received: Nov 15, 2018 6:15 PM
Eurofins | mgt reference: **627998**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 5.2 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Rohan Hammond - rhammond@jbsg.com.au.

Note: A copy of these results will also be delivered to the general JBS & G Australia (NSW) P/L email address.

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
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Site # 1254 & 14271

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Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 55073

Order No.:
Report #: 627998
Phone: 02 8245 0300
Fax:

Received: Nov 15, 2018 6:15 PM
Due: Nov 22, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Chloride	Ethane*	Ethylene*	Ferrous Iron - Fe2+	Isopropanol	Methane	Nitrate (as N)	pH (at 25°C)	Sulphate (as SO4)	Total Alkalinity (as CaCO3)	Total Organic Carbon	BTEX	Volatile Organics	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																			
Brisbane Laboratory - NATA Site # 20794																			
Perth Laboratory - NATA Site # 23736																			
External Laboratory																			
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**														
1	JBMW02	Nov 15, 2018		Water	S18-No20418	X	X	X	X		X	X	X	X	X	X		X	
2	JBMW05	Nov 15, 2018		Water	S18-No20419	X	X	X	X		X	X	X	X	X	X		X	
3	PSM01	Nov 15, 2018		Water	S18-No20420	X	X	X	X		X	X	X	X	X	X		X	
4	QA151118	Nov 15, 2018		Water	S18-No20421	X	X	X	X		X	X	X	X	X	X		X	
5	RIN151118	Nov 15, 2018		Water	S18-No20422													X	
6	TS	Nov 15, 2018		Water	S18-No20423												X		
7	TB	Nov 15, 2018		Water	S18-No20424												X		
8	SV18 (FRONT)	Nov 15, 2018		Air	S18-No20425					X									X
9	SV18 (BACK)	Nov 15, 2018		Air	S18-No20426					X									X

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

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Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Chloride	Ethane*	Ethylene*	Ferrous Iron - Fe2+	Isopropanol	Methane	Nitrate (as N)	pH (at 25°C)	Sulphate (as SO4)	Total Alkalinity (as CaCO3)	Total Organic Carbon	BTEX	Volatile Organics	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																			
Brisbane Laboratory - NATA Site # 20794																			
Perth Laboratory - NATA Site # 23736																			
10	SV19 (FRONT)	Nov 15, 2018		Air	S18-No20427					X									X
11	SV19 (BACK)	Nov 15, 2018		Air	S18-No20428					X									X
12	QA-V (FRONT)	Nov 15, 2018		Air	S18-No20429					X									X
13	QA-V (BACK)	Nov 15, 2018		Air	S18-No20430					X									X
14	MB (FRONT)	Nov 15, 2018		Air	S18-No20431					X									X
15	MB (BACK)	Nov 15, 2018		Air	S18-No20432					X									X
Test Counts						4	4	4	4	8	4	4	4	4	4	4	2	5	8

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **627998-A**
Project name PENRITH
Project ID 55073
Received Date Nov 15, 2018

Client Sample ID			**SV18 (FRONT)**	**SV18 (BACK)**	**SV19 (FRONT)**	**SV19 (BACK)**
Sample Matrix			**Air**	**Air**	**Air**	**Air**
Eurofins | mgt Sample No.			**S18-No20425**	**S18-No20426**	**S18-No20427**	**S18-No20428**
Date Sampled			**Nov 15, 2018**	**Nov 15, 2018**	**Nov 15, 2018**	**Nov 15, 2018**
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	2.0	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	1.6	< 0.5	2.0	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV18 (FRONT)	SV18 (BACK)	SV19 (FRONT)	SV19 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			S18-No20425	S18-No20426	S18-No20427	S18-No20428
Date Sampled			Nov 15, 2018	Nov 15, 2018	Nov 15, 2018	Nov 15, 2018
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	950	< 0.5	5700	< 0.5
Toluene	0.5	Total ug	0.6	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	8.3	< 0.5	53	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total	1.5	Total ug	1.8	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	78	117	104	110
4-Bromofluorobenzene (surr.)	1	%	77	114	82	106
Dibromofluoromethane (surr.)	1	%	95	109	108	106
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			QA-V (FRONT)	QA-V (BACK)	MB (FRONT)	MB (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			S18-No20429	S18-No20430	S18-No20431	S18-No20432
Date Sampled			Nov 15, 2018	Nov 15, 2018	Nov 15, 2018	Nov 15, 2018
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			QA-V (FRONT)	QA-V (BACK)	MB (FRONT)	MB (BACK)
Sample Matrix			**Air**	**Air**	**Air**	**Air**
Eurofins | mgt Sample No.			**S18-No20429**	**S18-No20430**	**S18-No20431**	**S18-No20432**
Date Sampled			**Nov 15, 2018**	**Nov 15, 2018**	**Nov 15, 2018**	**Nov 15, 2018**
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	1.7	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	2200	< 0.5	< 0.5	< 0.5
Toluene	0.5	Total ug	1.0	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	9.7	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total	1.5	Total ug	2.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	94	94	94	96
4-Bromofluorobenzene (surr.)	1	%	87	88	91	93
Dibromofluoromethane (surr.)	1	%	104	93	93	99
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Isopropanol	Melbourne	Nov 15, 2018	14 Days
- Method:			
VOCs in Ambient Air by GC/MS	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2030 VOCs in Ambient Air by GC/MS			

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NATA # 1261 Site # 18217

Brisbane
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NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 55073

Order No.:
Report #: 627998
Phone: 02 8245 0300
Fax:

Received: Nov 15, 2018 6:15 PM
Due: Nov 22, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Chloride	Ethane*	Ethylene*	Ferrous Iron - Fe2+	Isopropanol	Methane	Nitrate (as N)	pH (at 25°C)	Sulphate (as SO4)	Total Alkalinity (as CaCO3)	Total Organic Carbon	BTEX	Volatile Organics	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																			
Brisbane Laboratory - NATA Site # 20794																			
Perth Laboratory - NATA Site # 23736																			
External Laboratory																			
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**														
1	JBMW02	Nov 15, 2018		Water	S18-No20418	X	X	X	X		X	X	X	X	X	X		X	
2	JBMW05	Nov 15, 2018		Water	S18-No20419	X	X	X	X		X	X	X	X	X	X		X	
3	PSM01	Nov 15, 2018		Water	S18-No20420	X	X	X	X		X	X	X	X	X	X		X	
4	QA151118	Nov 15, 2018		Water	S18-No20421	X	X	X	X		X	X	X	X	X	X		X	
5	RIN151118	Nov 15, 2018		Water	S18-No20422													X	
6	TS	Nov 15, 2018		Water	S18-No20423												X		
7	TB	Nov 15, 2018		Water	S18-No20424												X		
8	SV18 (FRONT)	Nov 15, 2018		Air	S18-No20425					X									X
9	SV18 (BACK)	Nov 15, 2018		Air	S18-No20426					X									X

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Sample Detail						Chloride	Ethane*	Ethylene*	Ferrous Iron - Fe2+	Isopropanol	Methane	Nitrate (as N)	pH (at 25°C)	Sulphate (as SO4)	Total Alkalinity (as CaCO3)	Total Organic Carbon	BTEX	Volatile Organics	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																			
Brisbane Laboratory - NATA Site # 20794																			
Perth Laboratory - NATA Site # 23736																			
10	SV19 (FRONT)	Nov 15, 2018		Air	S18-No20427					X									X
11	SV19 (BACK)	Nov 15, 2018		Air	S18-No20428					X									X
12	QA-V (FRONT)	Nov 15, 2018		Air	S18-No20429					X									X
13	QA-V (BACK)	Nov 15, 2018		Air	S18-No20430					X									X
14	MB (FRONT)	Nov 15, 2018		Air	S18-No20431					X									X
15	MB (BACK)	Nov 15, 2018		Air	S18-No20432					X									X
Test Counts						4	4	4	4	8	4	4	4	4	4	4	2	5	8

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Isopropanol	Total ug	< 10			10	Pass	
Method Blank							
VOCs in Ambient Air by GC/MS							
1.1-Dichloroethane	Total ug	< 0.5			0.5	Pass	
1.1-Dichloroethene	Total ug	< 0.5			0.5	Pass	
1.1-Dichloropropene	Total ug	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	Total ug	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	Total ug	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	Total ug	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	Total ug	< 0.5			0.5	Pass	
1.2-Dibromo-3-chloropropane	Total ug	< 0.5			0.5	Pass	
1.2-Dibromoethane	Total ug	< 0.5			0.5	Pass	
1.2-Dichloroethane	Total ug	< 0.5			0.5	Pass	
1.2-Dichloropropane	Total ug	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	Total ug	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	Total ug	< 0.5			0.5	Pass	
1.3-Dichloropropane	Total ug	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	Total ug	< 0.5			0.5	Pass	
2-Chlorotoluene	Total ug	< 0.5			0.5	Pass	
2.2-Dichloropropane	Total ug	< 0.5			0.5	Pass	
4-Chlorotoluene	Total ug	< 0.5			0.5	Pass	
Benzene	Total ug	< 0.5			0.5	Pass	
Bromochloromethane	Total ug	< 0.5			0.5	Pass	
Bromodichloromethane	Total ug	< 0.5			0.5	Pass	
Bromoform	Total ug	< 0.5			0.5	Pass	
Carbon Tetrachloride	Total ug	< 0.5			0.5	Pass	
Chlorobenzene	Total ug	< 0.5			0.5	Pass	
Chloroform	Total ug	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	Total ug	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	Total ug	< 0.5			0.5	Pass	
Dibromochloromethane	Total ug	< 0.5			0.5	Pass	
Dibromomethane	Total ug	< 0.5			0.5	Pass	
Ethylbenzene	Total ug	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	Total ug	< 0.5			0.5	Pass	
n-Butylbenzene	Total ug	< 0.5			0.5	Pass	
n-Propylbenzene	Total ug	< 0.5			0.5	Pass	
Naphthalene	Total ug	< 0.5			0.5	Pass	
p-Isopropyltoluene	Total ug	< 0.5			0.5	Pass	
sec-Butylbenzene	Total ug	< 0.5			0.5	Pass	
Styrene	Total ug	< 5			5	Pass	
tert-Butylbenzene	Total ug	< 0.5			0.5	Pass	
Tetrachloroethene	Total ug	< 0.5			0.5	Pass	
Toluene	Total ug	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	Total ug	< 0.5			0.5	Pass	
Trichloroethene	Total ug	< 0.5			0.5	Pass	
Trichlorofluoromethane	Total ug	< 0.5			0.5	Pass	
Vinyl chloride	Total ug	< 0.5			0.5	Pass	
Xylenes - Total	Total ug	< 1.5			1.5	Pass	
1.2-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.2.3-Trichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.2.4-Trichlorobenzene	Total ug	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.3-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
Hexachlorobutadiene	Total ug	< 0.5			0.5	Pass	
LCS - % Recovery							
VOCs in Ambient Air by GC/MS							
1.1-Dichloroethene	%	75			70-130	Pass	
1.1-Dichloropropene	%	90			70-130	Pass	
1.1.1-Trichloroethane	%	83			70-130	Pass	
1.2-Dibromo-3-chloropropane	%	91			75-125	Pass	
1.2-Dichloroethane	%	87			70-130	Pass	
Benzene	%	92			70-130	Pass	
Ethylbenzene	%	96			70-130	Pass	
Naphthalene	%	77			70-130	Pass	
Toluene	%	88			70-130	Pass	
Trichloroethene	%	90			70-130	Pass	
Xylenes - Total	%	93			70-130	Pass	
1.2-Dichlorobenzene	%	92			70-130	Pass	
1.2.3-Trichlorobenzene	%	82			70-130	Pass	
1.2.4-Trichlorobenzene	%	93			70-130	Pass	
1.4-Dichlorobenzene	%	91			70-130	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Nibha Vaidya	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **627998-W**
Project name PENRITH
Project ID 55073
Received Date Nov 15, 2018

Client Sample ID			**JBMW02**	**JBMW05**	**PSM01**	**QA151118**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S18-No20418**	**S18-No20419**	**S18-No20420**	**S18-No20421**
Date Sampled			**Nov 15, 2018**	**Nov 15, 2018**	**Nov 15, 2018**	**Nov 15, 2018**
Test/Reference	LOR	Unit				
Dissolved Gases						
Ethane*	0.1	mg/L	0.1	0.1	< 0.1	< 0.1
Ethylene*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Methane	0.05	mg/L	0.09	< 0.05	0.73	0.74
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Butanone (MEK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Propanone (Acetone)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromodichloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromoform	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			JBMW02	JBMW05	PSM01	QA151118
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			S18-No20418	S18-No20419	S18-No20420	S18-No20421
Date Sampled			Nov 15, 2018	Nov 15, 2018	Nov 15, 2018	Nov 15, 2018
Test/Reference	LOR	Unit				
Volatile Organics						
Chloroform	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Chloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.2-Dichloroethene	0.001	mg/L	0.002	< 0.001	< 0.001	< 0.001
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dichlorodifluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Iodomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Methylene Chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Styrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Tetrachloroethene	0.001	mg/L	0.073	0.12	0.060	0.063
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichloroethene	0.001	mg/L	0.002	0.002	0.001	0.001
Trichlorofluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Total MAH*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	0.077	0.122	0.061	0.064
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	0.077	0.122	0.061	0.064
4-Bromofluorobenzene (surr.)	1	%	112	116	99	113
Toluene-d8 (surr.)	1	%	107	108	93	108
Chloride	1	mg/L	2600	2900	2000	2000
Ferrous Iron - Fe2+	0.05	mg/L	1.9	0.11	< 0.05	< 0.05
Nitrate (as N)	0.02	mg/L	1.2	< 0.02	1.0	1.1
pH (at 25°C)	0.1	pH Units	8.2	7.8	8.0	7.7
Sulphate (as SO4)	5	mg/L	140	280	59	60
Total Organic Carbon	5	mg/L	20	28	27	19
Alkalinity (speciated)						
Total Alkalinity (as CaCO3)	20	mg/L	600	620	440	430

Client Sample ID			RIN151118	R20TS	TB
Sample Matrix			Water	Water	Water
Eurofins | mgt Sample No.			S18-No20422	S18-No20423	S18-No20424
Date Sampled			Nov 15, 2018	Nov 15, 2018	Nov 15, 2018
Test/Reference	LOR	Unit			
BTEX					
Benzene	0.001	mg/L	-	80	< 0.001
Toluene	0.001	mg/L	-	90	< 0.001
Ethylbenzene	0.001	mg/L	-	94	< 0.001
m&p-Xylenes	0.002	mg/L	-	90	< 0.002
o-Xylene	0.001	mg/L	-	93	< 0.001

Client Sample ID			RIN151118	R20TS	TB
Sample Matrix			Water	Water	Water
Eurofins | mgt Sample No.			S18-No20422	S18-No20423	S18-No20424
Date Sampled			Nov 15, 2018	Nov 15, 2018	Nov 15, 2018
Test/Reference	LOR	Unit			
BTEX					
Xylenes - Total	0.003	mg/L	-	91	< 0.003
4-Bromofluorobenzene (surr.)	1	%	-	90	95
Volatile Organics					
1.1-Dichloroethane	0.001	mg/L	< 0.001	-	-
1.1-Dichloroethene	0.001	mg/L	< 0.001	-	-
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	-	-
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	-	-
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	-	-
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	-	-
1.2-Dibromoethane	0.001	mg/L	< 0.001	-	-
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	-	-
1.2-Dichloroethane	0.001	mg/L	< 0.001	-	-
1.2-Dichloropropane	0.001	mg/L	< 0.001	-	-
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	-	-
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	-	-
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	-	-
1.3-Dichloropropane	0.001	mg/L	< 0.001	-	-
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	-	-
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	-	-
2-Butanone (MEK)	0.001	mg/L	< 0.001	-	-
2-Propanone (Acetone)	0.001	mg/L	< 0.001	-	-
4-Chlorotoluene	0.001	mg/L	< 0.001	-	-
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	-	-
Allyl chloride	0.001	mg/L	< 0.001	-	-
Benzene	0.001	mg/L	< 0.001	-	-
Bromobenzene	0.001	mg/L	< 0.001	-	-
Bromochloromethane	0.001	mg/L	< 0.001	-	-
Bromodichloromethane	0.001	mg/L	< 0.001	-	-
Bromoform	0.001	mg/L	< 0.001	-	-
Bromomethane	0.001	mg/L	< 0.001	-	-
Carbon disulfide	0.001	mg/L	< 0.001	-	-
Carbon Tetrachloride	0.001	mg/L	< 0.001	-	-
Chlorobenzene	0.001	mg/L	< 0.001	-	-
Chloroethane	0.001	mg/L	< 0.001	-	-
Chloroform	0.005	mg/L	< 0.005	-	-
Chloromethane	0.001	mg/L	< 0.001	-	-
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001	-	-
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	-	-
Dibromochloromethane	0.001	mg/L	< 0.001	-	-
Dibromomethane	0.001	mg/L	< 0.001	-	-
Dichlorodifluoromethane	0.001	mg/L	< 0.001	-	-
Ethylbenzene	0.001	mg/L	< 0.001	-	-
Iodomethane	0.001	mg/L	< 0.001	-	-
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	-	-
m&p-Xylenes	0.002	mg/L	< 0.002	-	-
Methylene Chloride	0.001	mg/L	< 0.001	-	-
o-Xylene	0.001	mg/L	< 0.001	-	-
Styrene	0.001	mg/L	< 0.001	-	-
Tetrachloroethene	0.001	mg/L	< 0.001	-	-

Client Sample ID			RIN151118	R20TS	TB
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S18-No20422**	**S18-No20423**	**S18-No20424**
Date Sampled			**Nov 15, 2018**	**Nov 15, 2018**	**Nov 15, 2018**
Test/Reference	LOR	Unit			
Volatile Organics					
Toluene	0.001	mg/L	< 0.001	-	-
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	-	-
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	-	-
Trichloroethene	0.001	mg/L	< 0.001	-	-
Trichlorofluoromethane	0.001	mg/L	< 0.001	-	-
Vinyl chloride	0.001	mg/L	< 0.001	-	-
Xylenes - Total	0.003	mg/L	< 0.003	-	-
Total MAH*	0.003	mg/L	< 0.003	-	-
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	< 0.005	-	-
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.005	-	-
4-Bromofluorobenzene (surr.)	1	%	109	-	-
Toluene-d8 (surr.)	1	%	94	-	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
BTEX	Melbourne	Nov 19, 2018	14 Day
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Dissolved Gases	Melbourne	Nov 19, 2018	7 Day
- Method: LTM-ORG-2070 by Headspace GC-FID			
Volatile Organics	Melbourne	Nov 19, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Chloride	Melbourne	Nov 19, 2018	28 Day
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
Ferrous Iron - Fe2+	Melbourne	Nov 23, 2018	7 Days
- Method: LTM-INO-4190 Ferrous Iron in Water by Discrete Analyser			
Nitrate (as N)	Melbourne	Nov 19, 2018	28 Day
- Method: APHA 4500-NO3 Nitrate Nitrogen by FIA			
pH (at 25°C)	Melbourne	Nov 20, 2018	0 Hours
- Method: LTM-GEN-7090 pH in water by ISE			
Sulphate (as SO4)	Melbourne	Nov 19, 2018	28 Day
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
Total Organic Carbon	Melbourne	Nov 19, 2018	28 Day
- Method: APHA 5310B Total Organic Carbon			
Alkalinity (speciated)	Melbourne	Nov 20, 2018	14 Day
- Method: APHA 2320 Alkalinity by Titration			

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 55073

Order No.:
Report #: 627998
Phone: 02 8245 0300
Fax:

Received: Nov 15, 2018 6:15 PM
Due: Nov 22, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Chloride	Ethane*	Ethylene*	Ferrous Iron - Fe2+	Isopropanol	Methane	Nitrate (as N)	pH (at 25°C)	Sulphate (as SO4)	Total Alkalinity (as CaCO3)	Total Organic Carbon	BTEX	Volatile Organics	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																			
Brisbane Laboratory - NATA Site # 20794																			
Perth Laboratory - NATA Site # 23736																			
External Laboratory																			
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**														
1	JBMW02	Nov 15, 2018		Water	S18-No20418	X	X	X	X		X	X	X	X	X	X		X	
2	JBMW05	Nov 15, 2018		Water	S18-No20419	X	X	X	X		X	X	X	X	X	X		X	
3	PSM01	Nov 15, 2018		Water	S18-No20420	X	X	X	X		X	X	X	X	X	X		X	
4	QA151118	Nov 15, 2018		Water	S18-No20421	X	X	X	X		X	X	X	X	X	X		X	
5	RIN151118	Nov 15, 2018		Water	S18-No20422													X	
6	TS	Nov 15, 2018		Water	S18-No20423												X		
7	TB	Nov 15, 2018		Water	S18-No20424												X		
8	SV18 (FRONT)	Nov 15, 2018		Air	S18-No20425					X									X
9	SV18 (BACK)	Nov 15, 2018		Air	S18-No20426					X									X

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																			
Brisbane Laboratory - NATA Site # 20794																			
Perth Laboratory - NATA Site # 23736																			
10	SV19 (FRONT)	Nov 15, 2018		Air	S18-No20427					X									X
11	SV19 (BACK)	Nov 15, 2018		Air	S18-No20428					X									X
12	QA-V (FRONT)	Nov 15, 2018		Air	S18-No20429					X									X
13	QA-V (BACK)	Nov 15, 2018		Air	S18-No20430					X									X
14	MB (FRONT)	Nov 15, 2018		Air	S18-No20431					X									X
15	MB (BACK)	Nov 15, 2018		Air	S18-No20432					X									X
Test Counts						4	4	4	4	8	4	4	4	4	4	4	2	5	8

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Dissolved Gases							
Ethane*	mg/L	< 0.1			0.1	Pass	
Ethylene*	mg/L	< 0.1			0.1	Pass	
Methane	mg/L	< 0.05			0.05	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Benzene	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Chloride	mg/L	< 1			1	Pass	
Ferrous Iron - Fe2+	mg/L	< 0.05			0.05	Pass	
Nitrate (as N)	mg/L	< 0.02			0.02	Pass	
Sulphate (as SO4)	mg/L	< 5			5	Pass	
Total Organic Carbon	mg/L	< 5			5	Pass	
Method Blank							
Alkalinity (speciated)							
Total Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	101			70-130	Pass	
Toluene	%	88			70-130	Pass	
Ethylbenzene	%	92			70-130	Pass	
m&p-Xylenes	%	88			70-130	Pass	
Xylenes - Total	%	89			70-130	Pass	
LCS - % Recovery							
Dissolved Gases							
Ethane*	%	107			70-130	Pass	
Ethylene*	%	109			70-130	Pass	
Methane	%	109			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	81			70-130	Pass	
1.1.1-Trichloroethane	%	91			70-130	Pass	
1.2-Dichlorobenzene	%	89			70-130	Pass	
1.2-Dichloroethane	%	106			70-130	Pass	
Benzene	%	101			70-130	Pass	
Ethylbenzene	%	92			70-130	Pass	
m&p-Xylenes	%	88			70-130	Pass	
Toluene	%	88			70-130	Pass	
Trichloroethene	%	89			70-130	Pass	
Xylenes - Total	%	89			70-130	Pass	
LCS - % Recovery							
Chloride	%	118			70-130	Pass	
Ferrous Iron - Fe2+	%	121			70-130	Pass	
Nitrate (as N)	%	99			70-130	Pass	
Sulphate (as SO4)	%	108			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Organic Carbon			%	103			70-130	Pass	
LCS - % Recovery									
Alkalinity (speciated)									
Total Alkalinity (as CaCO3)			%	98			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Dissolved Gases				Result 1					
Methane	S18-No20280	NCP	%	111			70-130	Pass	
Spike - % Recovery									
				Result 1					
Nitrate (as N)	S18-No20280	NCP	%	96			70-130	Pass	
Spike - % Recovery									
Alkalinity (speciated)				Result 1					
Total Alkalinity (as CaCO3)	B18-No23810	NCP	%	95			70-130	Pass	
Spike - % Recovery									
				Result 1					
Ferrous Iron - Fe2+	M18-No25179	NCP	%	92			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-No21976	NCP	%	82			70-130	Pass	
Toluene	M18-No21976	NCP	%	86			70-130	Pass	
Ethylbenzene	M18-No21976	NCP	%	90			70-130	Pass	
m&p-Xylenes	M18-No21976	NCP	%	89			70-130	Pass	
o-Xylene	M18-No21976	NCP	%	88			70-130	Pass	
Xylenes - Total	M18-No21976	NCP	%	89			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Chloride	B18-No18872	NCP	mg/L	1700	1700	1.0	30%	Pass	
Nitrate (as N)	S18-No20280	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
pH (at 25°C)	M18-No22697	NCP	pH Units	7.9	7.9	pass	30%	Pass	
Sulphate (as SO4)	S18-No20275	NCP	mg/L	56	57	1.1	30%	Pass	
Total Organic Carbon	S18-No20418	CP	mg/L	20	18	6.0	30%	Pass	
Duplicate									
Alkalinity (speciated)				Result 1	Result 2	RPD			
Total Alkalinity (as CaCO3)	M18-No25228	NCP	mg/L	510	520	2.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ferrous Iron - Fe2+	S18-No20419	CP	mg/L	0.11	0.11	5.0	30%	Pass	
Duplicate									
Dissolved Gases				Result 1	Result 2	RPD			
Ethane*	S18-No20420	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Ethylene*	S18-No20420	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Methane	S18-No20420	CP	mg/L	0.73	0.73	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-No21975	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M18-No21975	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M18-No21975	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M18-No21975	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M18-No21975	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M18-No21975	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Nibha Vaidya	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Julie Kay	Senior Analyst-Inorganic (VIC)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

016623

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 55073	LABORATORY BATCH NO.:
PROJECT NAME: Penrith	SAMPLERS: CB
DATE NEEDED BY: standard turn around time	QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) rhammond@jbsg.com.au; (3) cbennett@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	VOCs	BTEX	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
JBMW06	water	21/11		4x vials		X				
JBMW07	↓	↓		↓		X				
RIN211118				2x V 1x M 1x A		X				
TS				2x V			X			
TB	↓	↓		2x V			X			

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: CB DATE: 21/11/18	CONSIGNMENT NOTE NO.	NAME: Luca D. 21/11/18	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 5:48 PM	COOLER TEMP ..... deg C 10.1°C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody - Generic

628902

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Enviro Sample NSW

From: Rohan Hammond <RHammond@jbsg.com.au>
Sent: Wednesday, 21 November 2018 10:10 PM
To: Enviro Sample NSW; Nibha Vaidya
Subject: 55073 water samples

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Nibha,

Just confirming the water samples received today for 55073 are on 24 hr tat.

I forgot to double check the COC.

Rohan

Sent from my Samsung Galaxy smartphone.

Click here to report this email as spam.

ScannedByWebsenseForEurofins

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Rohan Hammond
Project name: PENRITH
Project ID: 55073
COC number: Not provided
Turn around time: 1 Day
Date/Time received: Nov 21, 2018 5:48 PM
Eurofins | mgt reference: **628902**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 10.1 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Rohan Hammond - rhammond@jbsg.com.au.

Note: A copy of these results will also be delivered to the general JBS & G Australia (NSW) P/L email address.

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

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Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	JBS & G Australia (NSW) P/L	**Order No.:**		**Received:**	Nov 21, 2018 5:48 PM
Address:	Level 1, 50 Margaret St Sydney NSW 2000	**Report #:**	628902	**Due:**	Nov 22, 2018
		Phone:	02 8245 0300	**Priority:**	1 Day
		Fax:		**Contact Name:**	Rohan Hammond
Project Name:	PENRITH				
Project ID:	55073				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						BTEX	Volatile Organics
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	JBMW06	Nov 21, 2018		Water	S18-No27821		X
2	JBMW07	Nov 21, 2018		Water	S18-No27822		X
3	RIN211118	Nov 21, 2018		Water	S18-No27823		X
4	TS	Nov 21, 2018		Water	S18-No27824	X	
5	TB	Nov 21, 2018		Water	S18-No27825	X	
Test Counts						2	3

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **628902-W**
Project name PENRITH
Project ID 55073
Received Date Nov 21, 2018

Client Sample ID			**JBMW06**	**JBMW07**	**RIN211118**	**TS**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S18-No27821**	**S18-No27822**	**S18-No27823**	**S18-No27824**
Date Sampled			**Nov 21, 2018**	**Nov 21, 2018**	**Nov 21, 2018**	**Nov 21, 2018**
Test/Reference	LOR	Unit				
BTEX						
Comments						R20
Benzene	0.001	mg/L	-	-	-	110
Toluene	0.001	mg/L	-	-	-	100
Ethylbenzene	0.001	mg/L	-	-	-	110
m&p-Xylenes	0.002	mg/L	-	-	-	100
o-Xylene	0.001	mg/L	-	-	-	100
Xylenes - Total	0.003	mg/L	-	-	-	100
4-Bromofluorobenzene (surr.)	1	%	-	-	-	114
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
2-Butanone (MEK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
2-Propanone (Acetone)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Bromodichloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Bromoform	0.001	mg/L	< 0.001	< 0.001	< 0.001	-

Client Sample ID			JBMW06	JBMW07	RIN211118	TS
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			S18-No27821	S18-No27822	S18-No27823	S18-No27824
Date Sampled			Nov 21, 2018	Nov 21, 2018	Nov 21, 2018	Nov 21, 2018
Test/Reference	LOR	Unit				
Volatile Organics						
Bromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Chloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Chloroform	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Chloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Dibromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Dichlorodifluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Iodomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Methylene Chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Styrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Tetrachloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Trichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Trichlorofluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	-
Total MAH*	0.003	mg/L	< 0.003	< 0.003	< 0.003	-
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
4-Bromofluorobenzene (surr.)	1	%	112	92	102	-
Toluene-d8 (surr.)	1	%	105	87	98	-

Client Sample ID			TB
Sample Matrix			Water
Eurofins | mgt Sample No.			S18-No27825
Date Sampled			Nov 21, 2018
Test/Reference	LOR	Unit	
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	129

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
BTEX	Melbourne	Nov 22, 2018	14 Day
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Volatile Organics	Melbourne	Nov 22, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			

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NATA # 1261 Site # 18217

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Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	JBS & G Australia (NSW) P/L	**Order No.:**		**Received:**	Nov 21, 2018 5:48 PM
Address:	Level 1, 50 Margaret St Sydney NSW 2000	**Report #:**	628902	**Due:**	Nov 22, 2018
		Phone:	02 8245 0300	**Priority:**	1 Day
		Fax:		**Contact Name:**	Rohan Hammond
Project Name:	PENRITH				
Project ID:	55073				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						BTEX	Volatile Organics
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	JBMW06	Nov 21, 2018		Water	S18-No27821		X
2	JBMW07	Nov 21, 2018		Water	S18-No27822		X
3	RIN211118	Nov 21, 2018		Water	S18-No27823		X
4	TS	Nov 21, 2018		Water	S18-No27824	X	
5	TB	Nov 21, 2018		Water	S18-No27825	X	
Test Counts						2	3

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Benzene	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	100			70-130	Pass	
Toluene	%	97			70-130	Pass	
Ethylbenzene	%	83			70-130	Pass	
m&p-Xylenes	%	81			70-130	Pass	
Xylenes - Total	%	83			70-130	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Nibha Vaidya	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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CERTIFICATE OF ANALYSIS 205736

Client Details

Client	JBS & G (NSW & WA) Pty Ltd
Attention	C Bennett, Rohan Hammond
Address	Level 1, 50 Margaret St, Sydney, NSW, 2000

Sample Details

Your Reference	**55073, Penrith**
Number of Samples	1 Water, 1 Carbon Tube
Date samples received	15/11/2018
Date completed instructions received	15/11/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	22/11/2018
Date of Issue	22/11/2018

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Chris Guo, Senior Chemist, Air
Jeremy Faircloth, Organics Supervisor
Nick Sarlamis, Inorganics Supervisor
Steven Luong, Senior Chemist

Authorised By

Jacinta Hurst, Laboratory Manager

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

VOCs in water		
Our Reference		205736-1
Your Reference	UNITS	QC15118
Date Sampled		15/11/2018
Type of sample		Water
Date extracted	-	20/11/2018
Date analysed	-	21/11/2018
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	<1
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	53
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1
Bromoform	µg/L	<1

VOCs in water		
Our Reference		205736-1
Your Reference	UNITS	QC15118
Date Sampled		15/11/2018
Type of sample		Water
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	105
Surrogate toluene-d8	%	99
Surrogate 4-BFB	%	98

Miscellaneous Inorganics		
Our Reference		205736-1
Your Reference	UNITS	QC15118
Date Sampled		15/11/2018
Type of sample		Water
Date prepared	-	15/11/2018
Date analysed	-	15/11/2018
Sulphate, SO4	mg/L	63
Nitrate as N in water	mg/L	0.82
Chloride, Cl	mg/L	1,800
Ferrous Iron	mg/L	1.7
pH	pH Units	6.5
Total Organic Carbon	mg/L	2
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	400
Carbonate Alkalinity as $CaCO_3$	mg/L	<5
Total Alkalinity as $CaCO_3$	mg/L	400

Dissolved Gases in Water		
Our Reference		205736-1
Your Reference	UNITS	QC15118
Date Sampled		15/11/2018
Type of sample		Water
Date prepared	-	16/11/2018
Date analysed	-	16/11/2018
Methane	µg/L	780
Ethene	µg/L	<5
Ethane	µg/L	<5

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

VOC in Carbon tubes		
Our Reference		205736-2
Your Reference	UNITS	QC-V
Date Sampled		-
Type of sample		Carbon Tube
Date extracted	-	20/11/2018
Date analysed	-	20/11/2018
Acetone	µg/tube	<5
Acrylonitrile	µg/tube	<5
Methylethylketone (MEK)	µg/tube	<5
Hexane	µg/tube	<5
Ethylacetate	µg/tube	<5
1,2-Dichloroethane	µg/tube	<5
Benzene	µg/tube	<2
Carbon Tetrachloride	µg/tube	<5
Cyclohexane	µg/tube	<5
Ethylacrylate	µg/tube	<5
Trichloroethene	µg/tube	53
1,4-Dioxane	µg/tube	<5
Propylene Oxide	µg/tube	<10
Epichlorohydrin	µg/tube	<5
Methylisobutylketone (MIBK)	µg/tube	<5
Toluene	µg/tube	<5
Tetrachloroethene	µg/tube	7,800
n-Butylacetate	µg/tube	<5
Chlorobenzene	µg/tube	<5
Ethylbenzene	µg/tube	<5
m-Xylene	µg/tube	<5
p-Xylene	µg/tube	<5
Styrene	µg/tube	<5
o-Xylene	µg/tube	<5
Cyclohexanone	µg/tube	<5
Nonane	µg/tube	<5
Isopropylbenzene	µg/tube	<5
Diisobutylketone (DIBK)	µg/tube	<5
a-Methylstyrene	µg/tube	<5
Decane	µg/tube	<5
Benzylchloride	µg/tube	<5
Naphthalene	µg/tube	<5
Dodecane	µg/tube	<5
TVOC's as hexane in tubes*	µg/tube	27,000
Surrogate Toluene-d8	%	101

VOC in Carbon tubes		
Our Reference		205736-2
Your Reference	UNITS	QC-V
Date Sampled		-
Type of sample		Carbon Tube
Surrogate 4-Bromofluorobenzene	%	100

Method ID	Methodology Summary
AT-006	Dissolved gases determined by GC-FID using method USEPA SOP RSK175
AT-008	Determination of volatile organic compounds in charcoal tubes/badges/sorbents using CS2 extraction, based on NIOSH methods. Desorption efficiencies are not applied to results in ug/tube. Note where µg/m^3 results are supplied for SKC badges, the factors used are for 575-001, if 575-001 data is unavailable for an analyte then use 575-002 then 575-003 (exposure time must be supplied).
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-055	Nitrate - determined colourimetrically. Soils are analysed following a water extraction.
Inorg-076	Ferrous Iron is determined colourimetrically by discrete analyser.
Inorg-079	TOC determined using a TOC analyser using the combustion method. Dissolved requires filtering prior to determination. Analysis using APHA latest edition 5310B.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Alternatively determined by colourimetry/turbidity using Discrete Analyer.
Org-013	Water samples are analysed directly by purge and trap GC-MS.

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			20/11/2018	[NT]	[NT]	[NT]	[NT]	20/11/2018	[NT]
Date analysed	-			21/11/2018	[NT]	[NT]	[NT]	[NT]	21/11/2018	[NT]
Dichlorodifluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
2,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
1,1,1-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
1,1-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromomethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Bromodichloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
1,2-dibromoethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromoform	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-013	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Styrene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
o-xylene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
1,2,3-trichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-013	101	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate toluene-d8	%		Org-013	97	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-BFB	%		Org-013	102	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			15/11/2018	[NT]	[NT]	[NT]	[NT]	15/11/2018	[NT]
Date analysed	-			15/11/2018	[NT]	[NT]	[NT]	[NT]	15/11/2018	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	96	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Ferrous Iron	mg/L	0.05	Inorg-076	<0.05	[NT]	[NT]	[NT]	[NT]	94	[NT]
pH	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]
Total Organic Carbon	mg/L	1	Inorg-079	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: Dissolved Gases in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			16/11/2018	1	16/11/2018	16/11/2018		16/11/2018	[NT]
Date analysed	-			16/11/2018	1	16/11/2018	16/11/2018		16/11/2018	[NT]
Methane	µg/L	5	AT-006	<5	1	780	770	1	99	[NT]
Ethene	µg/L	5	AT-006	<5	1	<5	<5	0	97	[NT]
Ethane	µg/L	5	AT-006	<5	1	<5	<5	0	98	[NT]

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

QUALITY CONTROL: VOC in Carbon tubes					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			20/11/2018	[NT]	[NT]	[NT]	[NT]	20/11/2018	[NT]
Date analysed	-			20/11/2018	[NT]	[NT]	[NT]	[NT]	20/11/2018	[NT]
Acetone	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	108	[NT]
Acrylonitrile	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	110	[NT]
Methylethylketone (MEK)	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	117	[NT]
Hexane	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	115	[NT]
Ethylacetate	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	118	[NT]
1,2-Dichloroethane	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	114	[NT]
Benzene	µg/tube	2	AT-008	<2	[NT]	[NT]	[NT]	[NT]	108	[NT]
Carbon Tetrachloride	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	109	[NT]
Cyclohexane	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	107	[NT]
Ethylacrylate	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	106	[NT]
Trichloroethene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	104	[NT]
1,4-Dioxane	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	107	[NT]
Propylene Oxide	µg/tube	10	AT-008	<10	[NT]	[NT]	[NT]	[NT]	106	[NT]
Epichlorohydrin	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	106	[NT]
Methylisobutylketone (MIBK)	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	98	[NT]
Toluene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	94	[NT]
Tetrachloroethene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	89	[NT]
n-Butylacetate	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	91	[NT]
Chlorobenzene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	87	[NT]
Ethylbenzene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	85	[NT]
m-Xylene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	86	[NT]
p-Xylene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	84	[NT]
Styrene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	84	[NT]
o-Xylene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	84	[NT]
Cyclohexanone	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	86	[NT]
Nonane	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	84	[NT]
Isopropylbenzene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	83	[NT]
Diisobutylketone (DIBK)	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	83	[NT]
a-Methylstyrene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	84	[NT]
Decane	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	83	[NT]
Benzylchloride	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	81	[NT]
Naphthalene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	82	[NT]
Dodecane	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	81	[NT]
TVOC's as hexane in tubes*	µg/tube	50	AT-008	<50	[NT]	[NT]	[NT]	[NT]	115	[NT]
Surrogate Toluene-d8	%		AT-008	122	[NT]	[NT]	[NT]	[NT]	90	[NT]
Surrogate 4-Bromofluorobenzene	%		AT-008	114	[NT]	[NT]	[NT]	[NT]	80	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

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SAMPLE RECEIPT ADVICE

Client Details

Client	JBS & G (NSW & WA) Pty Ltd
Attention	C Bennett, Rohan Hammond

Sample Login Details

Your reference	55073, Penrith
Envirolab Reference	205736
Date Sample Received	15/11/2018
Date Instructions Received	15/11/2018
Date Results Expected to be Reported	22/11/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	1 Water, 1 Carbon Tube
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	1.2
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Sample ID	VOCs in water	Sulphate, SO4	Nitrate as N in water	Chloride, Cl	Ferrous Iron	pH	Total Organic Carbon	Hydroxide Alkalinity (OH-) as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Dissolved Gases in Water	VOC in Carbon tubes
QC15118	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
QC-V													✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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CERTIFICATE OF ANALYSIS 205744

Client Details

Client	JBS & G (NSW & WA) Pty Ltd
Attention	Rohan Hammond
Address	Level 1, 50 Margaret St, Sydney, NSW, 2000

Sample Details

Your Reference	**Penrith**
Number of Samples	4xAir
Date samples received	16/11/2018
Date completed instructions received	16/11/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	23/11/2018
Date of Issue	21/11/2018

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Chris Guo, Senior Chemist, Air

Authorised By

Jacinta Hurst, Laboratory Manager

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

TO15 in Canisters/Bags					
Our Reference		205744-1	205744-2	205744-3	205744-4
Your Reference	UNITS	2/134_SHOP	140_SHOP	QA_AA1	140_SHOP_2
Date Sampled		15/11/2018	15/11/2018	15/11/2018	15/11/2018
Type of sample		Air	Air	Air	Air
Air Kit Security No.		h2879	h2877	h3341	h3623
Vacuum before Shipment	Hg"	-30	-30	-30	-30
Vacuum before Analysis	Hg"	-10	-9	-10	-10
Date prepared	-	20/11/2018	20/11/2018	20/11/2018	20/11/2018
Date analysed	-	20/11/2018	20/11/2018	20/11/2018	20/11/2018
Propylene	ppbv	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	ppbv	<0.5	<0.5	<0.5	0.5
Chloromethane	ppbv	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorotetrafluoroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	ppbv	<0.5	<0.5	<0.5	<0.5
1,3-Butadiene	ppbv	<0.5	<0.5	<0.5	<0.5
Bromomethane	ppbv	<0.5	<0.5	<0.5	<0.5
Chloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Ethanol	ppbv	180	51	53	77
Acrolein	ppbv	4	<0.5	<0.5	<0.5
Trichlorofluoromethane (Freon 11)	ppbv	<0.5	<0.5	<0.5	<0.5
Acetone	ppbv	10	<5	<5	<5
Isopropyl Alcohol	ppbv	<5	7	7	<5
1,1-Dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichlorotrifluoroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Methylene chloride (Dichloromethane)	ppbv	<5	<5	<5	<5
Carbon Disulfide	ppbv	<0.5	0.6	0.5	<0.5
trans-1,2-dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5
MTBE	ppbv	<0.5	<0.5	<0.5	<0.5
1,1- Dichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Vinyl Acetate	ppbv	<0.5	<0.5	<0.5	<0.5
MEK	ppbv	<0.5	<0.5	<0.5	<0.5
Hexane	ppbv	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5
Ethyl Acetate	ppbv	7.0	1	1	<0.5
Chloroform	ppbv	0.6	<0.5	<0.5	<0.5
Tetrahydrofuran	ppbv	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Benzene	ppbv	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	ppbv	<0.5	<0.5	<0.5	<0.5
Cyclohexane	ppbv	<0.5	<0.5	<0.5	<0.5

TO15 in Canisters/Bags					
Our Reference		205744-1	205744-2	205744-3	205744-4
Your Reference	UNITS	2/134_SHOP	140_SHOP	QA_AA1	140_SHOP_2
Date Sampled		15/11/2018	15/11/2018	15/11/2018	15/11/2018
Type of sample		Air	Air	Air	Air
Air Kit Security No.		h2879	h2877	h3341	h3623
Heptane	ppbv	0.6	<0.5	<0.5	<0.5
Trichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	ppbv	<0.5	<0.5	<0.5	<0.5
1,4-Dioxane	ppbv	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	ppbv	<0.5	<0.5	<0.5	<0.5
Methyl Methacrylate	ppbv	<0.5	<0.5	<0.5	<0.5
MIBK	ppbv	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5	<0.5
Toluene	ppbv	1	0.7	0.7	0.6
1,1,2-Trichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Methyl Butyl Ketone	ppbv	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	ppbv	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	ppbv	<0.5	<0.5	<0.5	0.7
1,2-Dibromoethane	ppbv	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	ppbv	0.8	<0.5	<0.5	<0.5
m-& p-Xylene	ppbv	7	<1	<1	<1
Styrene	ppbv	<0.5	<0.5	<0.5	<0.5
o-Xylene	ppbv	2	<0.5	<0.5	<0.5
Bromoform	ppbv	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
4-ethyl toluene	ppbv	0.8	<0.5	<0.5	<0.5
1,3,5-Trimethylbenzene	ppbv	2	<0.5	<0.5	<0.5
1,2,4-Trimethylbenzene	ppbv	4	<0.5	<0.5	0.7
1,3-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5
Benzyl chloride	ppbv	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5
Naphthalene	ppbv	<0.5	<0.5	<0.5	<0.5
Hexachloro- 1,3-butadiene	ppbv	<0.5	<0.5	<0.5	<0.5
Surrogate-Bromochloromethane	% rec	99	118	102	98
Surrogate -1,4-Difluorobenzene	% rec	91	105	91	92
Surrogate-Chlorobenzene-D5	% rec	89	102	88	87

TO15 in Canisters ug/m3					
Our Reference		205744-1	205744-2	205744-3	205744-4
Your Reference	UNITS	2/134_SHOP	140_SHOP	QA_AA1	140_SHOP_2
Date Sampled		15/11/2018	15/11/2018	15/11/2018	15/11/2018
Type of sample		Air	Air	Air	Air
Air Kit Security No.		h2879	h2877	h3341	h3623
Vacuum before Shipment	Hg"	-30	-30	-30	-30
Vacuum before Analysis	Hg"	-10	-9	-10	-10
Date prepared	-	20/11/2018	20/11/2018	20/11/2018	20/11/2018
Date analysed	-	20/11/2018	20/11/2018	20/11/2018	20/11/2018
Propylene	µg/m³	<0.9	<0.9	<0.9	<0.9
Dichlorodifluoromethane	µg/m³	<2.5	<2.5	<2.5	3
Chloromethane	µg/m³	<1	<1	<1	<1
1,2-Dichlorotetrafluoroethane	µg/m³	<2.5	<2.5	<2.5	<2.5
Vinyl chloride	µg/m³	<1.3	<1.3	<1.3	<1.3
1,3-Butadiene	µg/m³	<1.1	<1.1	<1.1	<1.1
Bromomethane	µg/m³	<1.9	<1.9	<1.9	<1.9
Chloroethane	µg/m³	<1.3	<1.3	<1.3	<1.3
Ethanol	µg/m³	350	97	100	140
Acrolein	µg/m³	8	<1.1	<1.1	<1.1
Trichlorofluoromethane (Freon 11)	µg/m³	<2.8	<2.8	<2.8	<2.8
Acetone	µg/m³	30	<12	<12	<12
Isopropyl Alcohol	µg/m³	<12	20	20	<12
1,1-Dichloroethene	µg/m³	<2	<2	<2	<2
1,1,2-Trichlorotrifluoroethane	µg/m³	<3.8	<3.8	<3.8	<3.8
Methylene chloride (Dichloromethane)	µg/m³	<17	<17	<17	<17
Carbon Disulfide	µg/m³	<1.6	2	2	<1.6
trans-1,2-dichloroethene	µg/m³	<2	<2	<2	<2
MTBE	µg/m³	<1.8	<1.8	<1.8	<1.8
1,1- Dichloroethane	µg/m³	<2	<2	<2	<2
Vinyl Acetate	µg/m³	<1.8	<1.8	<1.8	<1.8
MEK	µg/m³	<1.5	<1.5	<1.5	<1.5
Hexane	µg/m³	<1.8	<1.8	<1.8	<1.8
cis-1,2-Dichloroethene	µg/m³	<2	<2	<2	<2
Ethyl Acetate	µg/m³	25	5	5	<1.8
Chloroform	µg/m³	3	<2.4	<2.4	<2.4
Tetrahydrofuran	µg/m³	<1.5	<1.5	<1.5	<1.5
1,1,1-Trichloroethane	µg/m³	<2.7	<2.7	<2.7	<2.7
1,2-Dichloroethane	µg/m³	<2	<2	<2	<2
Benzene	µg/m³	<1.6	<1.6	<1.6	<1.6
Carbon tetrachloride	µg/m³	<3.1	<3.1	<3.1	<3.1
Cyclohexane	µg/m³	<1.7	<1.7	<1.7	<1.7

TO15 in Canisters ug/m3					
Our Reference		205744-1	205744-2	205744-3	205744-4
Your Reference	UNITS	2/134_SHOP	140_SHOP	QA_AA1	140_SHOP_2
Date Sampled		15/11/2018	15/11/2018	15/11/2018	15/11/2018
Type of sample		Air	Air	Air	Air
Air Kit Security No.		h2879	h2877	h3341	h3623
Heptane	µg/m³	2	<2	<2	<2
Trichloroethene	µg/m³	<2.7	<2.7	<2.7	<2.7
1,2-Dichloropropane	µg/m³	<2.3	<2.3	<2.3	<2.3
1,4-Dioxane	µg/m³	<1.8	<1.8	<1.8	<1.8
Bromodichloromethane	µg/m³	<3.4	<3.4	<3.4	<3.4
Methyl Methacrylate	µg/m³	<2	<2	<2	<2
MIBK	µg/m³	<2	<2	<2	<2
cis-1,3-Dichloropropene	µg/m³	<2.3	<2.3	<2.3	<2.3
trans-1,3-Dichloropropene	µg/m³	<2.3	<2.3	<2.3	<2.3
Toluene	µg/m³	4	2	2	2
1,1,2-Trichloroethane	µg/m³	<2.7	<2.7	<2.7	<2.7
Methyl Butyl Ketone	µg/m³	<2	<2	<2	<2
Dibromochloromethane	µg/m³	<1.6	<1.6	<1.6	<1.6
Tetrachloroethene	µg/m³	<3.4	<3.4	<3.4	5
1,2-Dibromoethane	µg/m³	<3.8	<3.8	<3.8	<3.8
Chlorobenzene	µg/m³	<2.3	<2.3	<2.3	<2.3
Ethylbenzene	µg/m³	3	<2.2	<2.2	<2.2
m-& p-Xylene	µg/m³	30	<4.3	<4.3	<4.3
Styrene	µg/m³	<2.1	<2.1	<2.1	<2.1
o-Xylene	µg/m³	10	<2.2	<2.2	<2.2
Bromoform	µg/m³	<5.2	<5.2	<5.2	<5.2
1,1,2,2-Tetrachloroethane	µg/m³	<3.4	<3.4	<3.4	<3.4
4-ethyl toluene	µg/m³	4	<2.5	<2.5	<2.5
1,3,5-Trimethylbenzene	µg/m³	10	<2.5	<2.5	<2.5
1,2,4-Trimethylbenzene	µg/m³	20	<2.5	<2.5	4
1,3-Dichlorobenzene	µg/m³	<3	<3	<3	<3
Benzyl chloride	µg/m³	<2.6	<2.6	<2.6	<2.6
1,4-Dichlorobenzene	µg/m³	<3	<3	<3	<3
1,2-Dichlorobenzene	µg/m³	<3	<3	<3	<3
1,2,4-Trichlorobenzene	µg/m³	<3.7	<3.7	<3.7	<3.7
Naphthalene	µg/m³	<2.6	<2.6	<2.6	<2.6
Hexachloro- 1,3-butadiene	µg/m³	<5.3	<5.3	<5.3	<5.3
Surrogate-Bromochloromethane	% rec	99	118	102	98
Surrogate -1,4-Difluorobenzene	% rec	91	105	91	92
Surrogate-Chlorobenzene-D5	% rec	89	102	88	87

Method ID	Methodology Summary
TO15	USEPA TO15 - Analysis of VOC's in air following USEPA TO15 protocols
USEPA 18	Measurement of Gaseous Organic Compound Emissions by Gas Chromatography using USEPA m18.

QUALITY CONTROL: TO15 in Canisters/Bags					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Vacuum before Shipment	Hg"			[NT]	1	-30	-30	0	[NT]	[NT]
Vacuum before Analysis	Hg"			[NT]	1	-10	-10	0	[NT]	[NT]
Date prepared	-			20/11/2018	1	20/11/2018	20/11/2018		20/11/2018	[NT]
Date analysed	-			20/11/2018	1	20/11/2018	20/11/2018		20/11/2018	[NT]
Propylene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	111	[NT]
Dichlorodifluoromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichlorotetrafluoroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Vinyl chloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,3-Butadiene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Bromomethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethanol	ppbv	5	TO15	<5	1	180	180	0	[NT]	[NT]
Acrolein	ppbv	0.5	TO15	<0.5	1	4	4	0	[NT]	[NT]
Trichlorofluoromethane (Freon 11)	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Acetone	ppbv	5	TO15	<5	1	10	10	0	[NT]	[NT]
Isopropyl Alcohol	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	[NT]
1,1-Dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,2-Trichlorotrifluoroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methylene chloride (Dichloromethane)	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	[NT]
Carbon Disulfide	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
trans-1,2-dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MTBE	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1- Dichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Vinyl Acetate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MEK	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Hexane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	103	[NT]
cis-1,2-Dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethyl Acetate	ppbv	0.5	TO15	<0.5	1	7.0	5.8	19	[NT]	[NT]
Chloroform	ppbv	0.5	TO15	<0.5	1	0.6	0.6	0	[NT]	[NT]
Tetrahydrofuran	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,1-Trichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Benzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	107	[NT]
Carbon tetrachloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Cyclohexane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	97	[NT]
Heptane	ppbv	0.5	TO15	<0.5	1	0.6	0.6	0	106	[NT]
Trichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]

QUALITY CONTROL: TO15 in Canisters/Bags						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
1,2-Dichloropropane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,4-Dioxane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Bromodichloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methyl Methacrylate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MIBK	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
cis-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
trans-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Toluene	ppbv	0.5	TO15	<0.5	1	1	1	0	105	[NT]
1,1,2-Trichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methyl Butyl Ketone	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Dibromochloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Tetrachloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dibromoethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	ppbv	0.5	TO15	<0.5	1	0.8	0.8	0	110	[NT]
m-& p-Xylene	ppbv	1	TO15	<1	1	7	7	0	107	[NT]
Styrene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	103	[NT]
o-Xylene	ppbv	0.5	TO15	<0.5	1	2	2	0	110	[NT]
Bromoform	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,2,2-Tetrachloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
4-ethyl toluene	ppbv	0.5	TO15	<0.5	1	0.8	0.9	12	104	[NT]
1,3,5-Trimethylbenzene	ppbv	0.5	TO15	<0.5	1	2	2	0	107	[NT]
1,2,4-Trimethylbenzene	ppbv	0.5	TO15	<0.5	1	4	4	0	109	[NT]
1,3-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Benzyl chloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,4-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2,4-Trichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Naphthalene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Hexachloro- 1,3-butadiene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Surrogate-Bromochloromethane	% rec		TO15	104	1	99	81	20	106	[NT]
Surrogate -1,4-Difluorobenzene	% rec		TO15	98	1	91	113	22	98	[NT]
Surrogate-Chlorobenzene-D5	% rec		TO15	95	1	89	112	23	97	[NT]

QUALITY CONTROL: TO15 in Canisters ug/m3						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Vacuum before Shipment	Hg"			[NT]	1	-30	-30	0	[NT]	[NT]
Vacuum before Analysis	Hg"			[NT]	1	-10	-10	0	[NT]	[NT]
Date prepared	-			20/11/2018	1	20/11/2018	20/11/2018		[NT]	[NT]
Date analysed	-			20/11/2018	1	20/11/2018	20/11/2018		[NT]	[NT]
Propylene	µg/m³	0.9	TO15	<0.9	1	<0.9	<0.9	0	[NT]	[NT]
Dichlorodifluoromethane	µg/m³	2.5	TO15	<2.5	1	<2.5	<2.5	0	[NT]	[NT]
Chloromethane	µg/m³	1.0	TO15	<1.0	1	<1	<1	0	[NT]	[NT]
1,2-Dichlorotetrafluoroethane	µg/m³	2.5	TO15	<2.5	1	<2.5	<2.5	0	[NT]	[NT]
Vinyl chloride	µg/m³	1.3	TO15	<1.3	1	<1.3	<1.3	0	[NT]	[NT]
1,3-Butadiene	µg/m³	1.1	TO15	<1.1	1	<1.1	<1.1	0	[NT]	[NT]
Bromomethane	µg/m³	1.9	TO15	<1.9	1	<1.9	<1.9	0	[NT]	[NT]
Chloroethane	µg/m³	1.3	TO15	<1.3	1	<1.3	<1.3	0	[NT]	[NT]
Ethanol	µg/m³	9	TO15	<9	1	350	340	3	[NT]	[NT]
Acrolein	µg/m³	1.1	TO15	<1.1	1	8	8	0	[NT]	[NT]
Trichlorofluoromethane (Freon 11)	µg/m³	2.8	TO15	<2.8	1	<2.8	<2.8	0	[NT]	[NT]
Acetone	µg/m³	11.9	TO15	<11.9	1	30	30	0	[NT]	[NT]
Isopropyl Alcohol	µg/m³	12	TO15	<12	1	<12	<12	0	[NT]	[NT]
1,1-Dichloroethene	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
1,1,2-Trichlorotrifluoroethane	µg/m³	3.8	TO15	<3.8	1	<3.8	<3.8	0	[NT]	[NT]
Methylene chloride (Dichloromethane)	µg/m³	20	USEPA 18	<20	1	<17	<17	0	[NT]	[NT]
Carbon Disulfide	µg/m³	1.6	TO15	<1.6	1	<1.6	<1.6	0	[NT]	[NT]
trans-1,2-dichloroethene	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
MTBE	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
1,1- Dichloroethane	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
Vinyl Acetate	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
MEK	µg/m³	1.5	TO15	<1.5	1	<1.5	<1.5	0	[NT]	[NT]
Hexane	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
cis-1,2-Dichloroethene	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
Ethyl Acetate	µg/m³	1.8	TO15	<1.8	1	25	21	17	[NT]	[NT]
Chloroform	µg/m³	2.4	TO15	<2.4	1	3	3	0	[NT]	[NT]
Tetrahydrofuran	µg/m³	1.5	TO15	<1.5	1	<1.5	<1.5	0	[NT]	[NT]
1,1,1-Trichloroethane	µg/m³	2.7	TO15	<2.7	1	<2.7	<2.7	0	[NT]	[NT]
1,2-Dichloroethane	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
Benzene	µg/m³	1.6	TO15	<1.6	1	<1.6	<1.6	0	[NT]	[NT]
Carbon tetrachloride	µg/m³	3.1	TO15	<3.1	1	<3.1	<3.1	0	[NT]	[NT]
Cyclohexane	µg/m³	1.7	TO15	<1.7	1	<1.7	<1.7	0	[NT]	[NT]
Heptane	µg/m³	2.0	TO15	<2.0	1	2	2	0	[NT]	[NT]
Trichloroethene	µg/m³	2.7	TO15	<2.7	1	<2.7	<2.7	0	[NT]	[NT]

QUALITY CONTROL: TO15 in Canisters ug/m3						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
1,2-Dichloropropane	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0	[NT]	[NT]
1,4-Dioxane	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
Bromodichloromethane	µg/m³	3.4	TO15	<3.4	1	<3.4	<3.4	0	[NT]	[NT]
Methyl Methacrylate	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
MIBK	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
cis-1,3-Dichloropropene	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0	[NT]	[NT]
trans-1,3-Dichloropropene	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0	[NT]	[NT]
Toluene	µg/m³	1.9	TO15	<1.9	1	4	4	0	[NT]	[NT]
1,1,2-Trichloroethane	µg/m³	2.7	TO15	<2.7	1	<2.7	<2.7	0	[NT]	[NT]
Methyl Butyl Ketone	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
Dibromochloromethane	µg/m³	1.6	TO15	<1.6	1	<1.6	<1.6	0	[NT]	[NT]
Tetrachloroethene	µg/m³	3.4	TO15	<3.4	1	<3.4	<3.4	0	[NT]	[NT]
1,2-Dibromoethane	µg/m³	3.8	TO15	<3.8	1	<3.8	<3.8	0	[NT]	[NT]
Chlorobenzene	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0	[NT]	[NT]
Ethylbenzene	µg/m³	2.2	TO15	<2.2	1	3	4	29	[NT]	[NT]
m-& p-Xylene	µg/m³	4.3	TO15	<4.3	1	30	30	0	[NT]	[NT]
Styrene	µg/m³	2.1	TO15	<2.1	1	<2.1	<2.1	0	[NT]	[NT]
o-Xylene	µg/m³	2.2	TO15	<2.2	1	10	10	0	[NT]	[NT]
Bromoform	µg/m³	5.2	TO15	<5.2	1	<5.2	<5.2	0	[NT]	[NT]
1,1,2,2-Tetrachloroethane	µg/m³	3.4	TO15	<3.4	1	<3.4	<3.4	0	[NT]	[NT]
4-ethyl toluene	µg/m³	2.5	TO15	<2.5	1	4	4	0	[NT]	[NT]
1,3,5-Trimethylbenzene	µg/m³	2.5	TO15	<2.5	1	10	10	0	[NT]	[NT]
1,2,4-Trimethylbenzene	µg/m³	2.5	TO15	<2.5	1	20	20	0	[NT]	[NT]
1,3-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	1	<3	<3	0	[NT]	[NT]
Benzyl chloride	µg/m³	2.6	TO15	<2.6	1	<2.6	<2.6	0	[NT]	[NT]
1,4-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	1	<3	<3	0	[NT]	[NT]
1,2-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	1	<3	<3	0	[NT]	[NT]
1,2,4-Trichlorobenzene	µg/m³	3.7	TO15	<3.7	1	<3.7	<3.7	0	[NT]	[NT]
Naphthalene	µg/m³	2.6	TO15	<2.6	1	<2.6	<2.6	0	[NT]	[NT]
Hexachloro- 1,3-butadiene	µg/m³	5.3	TO15	<5.3	1	<5.3	<5.3	0	[NT]	[NT]
Surrogate-Bromochloromethane	% rec		TO15	104	1	99	81	20	[NT]	[NT]
Surrogate -1,4-Difluorobenzene	% rec		TO15	98	1	91	113	22	[NT]	[NT]
Surrogate-Chlorobenzene-D5	% rec		TO15	95	1	89	112	23	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

55073

ENVIROLAB

CANISTER CHAIN OF CUSTODY RECORD

Page 1 of 1

3BS 4G

Client Name	[redacted]	Project Contact	Rohan Hammond	Quote No	
Client Address	[redacted] 1/50 Margaret St, Sydney	Contact Phone No		Date Results Required	1 day / 2 days / 3 days / Standard
		Contact Mobile No	0430 379 445		
Project Name	Penrith	Results Required by	Std TAT	E-mail Report To	rhammond@jsbog.com.au cbennett@jsbog.com.au
Site Location	Penrith	Sampled by	CB	PO No	55073

Client sample ID (Field location)	Canister #	Soil gas train / Mass flow controller #	Leak Test Passed	PID Reading (ppmv)	Date of Collection	Collection Time		Canister vacuum (Hg")		Analysis requested							
						Time on	Time off	Initial	Final	TO-15	TPH	5-Sulfides	Ozone precursors	RGA gases			
safe 1/134_SHOP	H2879	1973			15.11.18	6:30	2:05	30	3	X							
140_SHOP	H2877	1975			↓	8:40	4:45	30	10	X							
QA_AA1	H3341	1974				8:40	4:47	29	7	X							
1 passage 140_SHOP_2	H3623	1964			↓	8:45	4:49	30	9	X							

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 205744

Date Received: 16/11/18

Time Received: 10:00 AM

Received By: HL

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Intact/Broken/None

Relinquished by	CB	Date & Time	15.11.18	Received by	Lab	Date & Time	16/11/18	Notes:
Print Name	Claudia Bennett	Signature		Print Name	Hnoko	Signature		

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Nibha Vaidya	Analytical Services Manager
Alex Petridis	Senior Analyst-Metal (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson
National Operations Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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www.envirolab.com.au

CERTIFICATE OF ANALYSIS 189181

Client Details

Client	JBS & G (NSW & WA) Pty Ltd
Attention	Rohan Hammond
Address	Level 1, 50 Margaret St, Sydney, NSW, 2000

Sample Details

Your Reference	**52372, PCC**
Number of Samples	2 Soil
Date samples received	11/04/2018
Date completed instructions received	11/04/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	18/04/2018
Date of Issue	17/04/2018

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Dragana Tomas, Senior Chemist
Jeremy Faircloth, Organics Supervisor
Leon Ow, Chemist

Authorised By

Jacinta Hurst, Laboratory Manager

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

VOCs in soil		
Our Reference		189181-2
Your Reference	UNITS	QA 9-4
Date Sampled		09/04/2018
Type of sample		Soil
Date extracted	-	16/04/2018
Date analysed	-	16/04/2018
Dichlorodifluoromethane	mg/kg	<1
Chloromethane	mg/kg	<1
Vinyl Chloride	mg/kg	<1
Bromomethane	mg/kg	<1
Chloroethane	mg/kg	<1
Trichlorofluoromethane	mg/kg	<1
1,1-Dichloroethene	mg/kg	<1
trans-1,2-dichloroethene	mg/kg	<1
1,1-dichloroethane	mg/kg	<1
cis-1,2-dichloroethene	mg/kg	<1
bromochloromethane	mg/kg	<1
chloroform	mg/kg	<1
2,2-dichloropropane	mg/kg	<1
1,2-dichloroethane	mg/kg	<1
1,1,1-trichloroethane	mg/kg	<1
1,1-dichloropropene	mg/kg	<1
Cyclohexane	mg/kg	<1
carbon tetrachloride	mg/kg	<1
Benzene	mg/kg	<0.2
dibromomethane	mg/kg	<1
1,2-dichloropropane	mg/kg	<1
trichloroethene	mg/kg	<1
bromodichloromethane	mg/kg	<1
trans-1,3-dichloropropene	mg/kg	<1
cis-1,3-dichloropropene	mg/kg	<1
1,1,2-trichloroethane	mg/kg	<1
Toluene	mg/kg	<0.5
1,3-dichloropropane	mg/kg	<1
dibromochloromethane	mg/kg	<1
1,2-dibromoethane	mg/kg	<1
tetrachloroethene	mg/kg	<1
1,1,1,2-tetrachloroethane	mg/kg	<1
chlorobenzene	mg/kg	<1
Ethylbenzene	mg/kg	<1
bromoform	mg/kg	<1

VOCs in soil		
Our Reference		189181-2
Your Reference	UNITS	QA 9-4
Date Sampled		09/04/2018
Type of sample		Soil
m+p-xylene	mg/kg	<2
styrene	mg/kg	<1
1,1,2,2-tetrachloroethane	mg/kg	<1
o-Xylene	mg/kg	<1
1,2,3-trichloropropane	mg/kg	<1
isopropylbenzene	mg/kg	<1
bromobenzene	mg/kg	<1
n-propyl benzene	mg/kg	<1
2-chlorotoluene	mg/kg	<1
4-chlorotoluene	mg/kg	<1
1,3,5-trimethyl benzene	mg/kg	<1
tert-butyl benzene	mg/kg	<1
1,2,4-trimethyl benzene	mg/kg	<1
1,3-dichlorobenzene	mg/kg	<1
sec-butyl benzene	mg/kg	<1
1,4-dichlorobenzene	mg/kg	<1
4-isopropyl toluene	mg/kg	<1
1,2-dichlorobenzene	mg/kg	<1
n-butyl benzene	mg/kg	<1
1,2-dibromo-3-chloropropane	mg/kg	<1
1,2,4-trichlorobenzene	mg/kg	<1
hexachlorobutadiene	mg/kg	<1
1,2,3-trichlorobenzene	mg/kg	<1
Surrogate Dibromofluorometha	%	76
Surrogate aaa-Trifluorotoluene	%	91
Surrogate Toluene-d_8	%	97
Surrogate 4-Bromofluorobenzene	%	91

TRH in Soil (C6-C9) NEPM		
Our Reference		189181-2
Your Reference	UNITS	QA 9-4
Date Sampled		09/04/2018
Type of sample		Soil
Date extracted	-	16/04/2018
Date analysed	-	16/04/2018
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
Surrogate aaa-Trifluorotoluene	%	102

svTRH (C10-C40) in Soil		
Our Reference		189181-2
Your Reference	UNITS	QA 9-4
Date Sampled		09/04/2018
Type of sample		Soil
Date extracted	-	13/04/2018
Date analysed	-	14/04/2018
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
TRH >C_{10} -C_{16}	mg/kg	<50
TRH >C_{16} -C_{34}	mg/kg	<100
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	87

PAHs in Soil		
Our Reference		189181-1
Your Reference	UNITS	QC 10-4
Date Sampled		10/04/2018
Type of sample		Soil
Date extracted	-	13/04/2018
Date analysed	-	13/04/2018
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	0.2
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	0.6
Pyrene	mg/kg	0.6
Benzo(a)anthracene	mg/kg	0.2
Chrysene	mg/kg	0.3
Benzo(b,j+k)fluoranthene	mg/kg	0.6
Benzo(a)pyrene	mg/kg	0.3
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	0.3
Total +ve PAH's	mg/kg	3.4
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.6
Surrogate p-Terphenyl-d14	%	101

Acid Extractable metals in soil		
Our Reference		189181-1
Your Reference	UNITS	QC 10-4
Date Sampled		10/04/2018
Type of sample		Soil
Date prepared	-	13/04/2018
Date analysed	-	13/04/2018
Arsenic	mg/kg	7
Cadmium	mg/kg	4.1
Chromium	mg/kg	16
Copper	mg/kg	42
Lead	mg/kg	240
Mercury	mg/kg	0.6
Nickel	mg/kg	13
Zinc	mg/kg	690

Moisture			
Our Reference		189181-1	189181-2
Your Reference	UNITS	QC 10-4	QA 9-4
Date Sampled		10/04/2018	09/04/2018
Type of sample		Soil	Soil
Date prepared	-	13/04/2018	13/04/2018
Date analysed	-	16/04/2018	16/04/2018
Moisture	%	13	11

Method ID	Methodology Summary
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: VOCs in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Date extracted	-			16/04/2018	[NT]	[NT]	[NT]	[NT]	16/04/2018	[NT]
Date analysed	-			16/04/2018	[NT]	[NT]	[NT]	[NT]	16/04/2018	[NT]
Dichlorodifluoromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
trans-1,2-dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
cis-1,2-dichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromochloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
chloroform	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
2,2-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
1,1,1-trichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	89	[NT]
1,1-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
carbon tetrachloride	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	mg/kg	0.2	Org-014	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
dibromomethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
trichloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	86	[NT]
bromodichloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
trans-1,3-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	mg/kg	0.5	Org-014	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
dibromochloromethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
1,2-dibromoethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
tetrachloroethene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
1,1,1,2-tetrachloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
chlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromoform	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-014	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
styrene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
o-Xylene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VOCs in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
1,2,3-trichloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
isopropylbenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
bromobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
tert-butyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
sec-butyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
hexachlorobutadiene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluorometha	%		Org-014	73	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-014	95	[NT]	[NT]	[NT]	[NT]	90	[NT]
Surrogate Toluene-d_8	%		Org-014	99	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-014	96	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: TRH in Soil (C6-C9) NEPM						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Date extracted	-			16/04/2018	[NT]	[NT]	[NT]	[NT]	16/04/2018	[NT]
Date analysed	-			16/04/2018	[NT]	[NT]	[NT]	[NT]	16/04/2018	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	91	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	107	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			13/04/2018	[NT]	[NT]	[NT]	[NT]	13/04/2018	[NT]
Date analysed	-			14/04/2018	[NT]	[NT]	[NT]	[NT]	14/04/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	96	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	96	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
Surrogate o-Terphenyl	%		Org-003	90	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date extracted	-			13/04/2018	[NT]	[NT]	[NT]	[NT]	13/04/2018	[NT]
Date analysed	-			13/04/2018	[NT]	[NT]	[NT]	[NT]	13/04/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	92	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	102	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	[NT]
Date prepared	-			13/04/2018	1	13/04/2018	13/04/2018		13/04/2018	[NT]
Date analysed	-			13/04/2018	1	13/04/2018	13/04/2018		13/04/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	7	6	15	108	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	4.1	4.0	2	100	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	16	14	13	107	[NT]
Copper	mg/kg	1	Metals-020	<1	1	42	41	2	110	[NT]
Lead	mg/kg	1	Metals-020	<1	1	240	240	0	106	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	0.6	0.4	40	92	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	13	12	8	103	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	690	780	12	104	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

010450

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52372	LABORATORY BATCH NO.:
PROJECT NAME: QC	SAMPLERS:
DATE NEEDED BY: Std	QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) ....Rhammond.....@jbsg.com.au; (3) .....@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	VOCs	TRHs	8 METALS	PAHs	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
1 QC 10-4	Soil	10-4-18	-	250mL				x	x			
2 QA 9-4	✓	9-4-18	-	250mL		x	x					

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No:
Date Received:
Time Received:
Received by:
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

ENVIROLAB

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 189181
Date Received: 11/4 1150
Time Received:
Received by: KA ELS
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Rotcraft DATE: 11-4-18	CONSIGNMENT NOTE NO.	NAME: KA 1150	COOLER SEAL – Yes ✓ No ..... Intact ✓ Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: ELS 11/4	COOLER TEMP 8.7 deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO Forms013 – Chain of Custody - Generic

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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12 Ashley St Chatswood NSW 2067
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www.envirolab.com.au

CERTIFICATE OF ANALYSIS 189745

Client Details

Client	JBS & G (NSW & WA) Pty Ltd
Attention	Rohan Hammond
Address	Level 1, 50 Margaret St, Sydney, NSW, 2000

Sample Details

Your Reference	**52372**
Number of Samples	2 Water
Date samples received	18/04/2018
Date completed instructions received	18/04/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	26/04/2018
Date of Issue	23/04/2018

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Results Approved By
Dragana Tomas, Senior Chemist
Jaimie Loa-Kum-Cheung, Senior Chemist
Jeremy Faircloth, Organics Supervisor
Steven Luong, Senior Chemist

Authorised By

Jacinta Hurst, Laboratory Manager

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

VOCs in water		
Our Reference		189745-1
Your Reference	UNITS	QA20180416
Date Sampled		16/04/2018
Type of sample		Water
Date extracted	-	18/04/2018
Date analysed	-	19/04/2018
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	<1
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	<1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	<1
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1
Bromoform	µg/L	<1

VOCs in water		
Our Reference		189745-1
Your Reference	UNITS	QA20180416
Date Sampled		16/04/2018
Type of sample		Water
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	129
Surrogate toluene-d8	%	91
Surrogate 4-BFB	%	91

vTRH(C6-C10)/BTEXN in Water		
Our Reference		189745-1
Your Reference	UNITS	QA20180416
Date Sampled		16/04/2018
Type of sample		Water
Date extracted	-	18/04/2018
Date analysed	-	19/04/2018
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	129
Surrogate toluene-d8	%	91
Surrogate 4-BFB	%	91

svTRH (C10-C40) in Water		
Our Reference		189745-2
Your Reference	UNITS	QA20180416-1
Date Sampled		16/04/2018
Type of sample		Water
Date extracted	-	19/04/2018
Date analysed	-	20/04/2018
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Surrogate o-Terphenyl	%	85

PAHs in Water - Low Level		
Our Reference		189745-2
Your Reference	UNITS	QA20180416-1
Date Sampled		16/04/2018
Type of sample		Water
Date extracted	-	19/04/2018
Date analysed	-	20/04/2018
Naphthalene	µg/L	<0.2
Acenaphthylene	µg/L	<0.1
Acenaphthene	µg/L	<0.1
Fluorene	µg/L	<0.1
Phenanthrene	µg/L	<0.1
Anthracene	µg/L	<0.1
Fluoranthene	µg/L	<0.1
Pyrene	µg/L	<0.1
Benzo(a)anthracene	µg/L	<0.1
Chrysene	µg/L	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2
Benzo(a)pyrene	µg/L	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	70

HM in water - dissolved		
Our Reference		189745-2
Your Reference	UNITS	QA20180416-1
Date Sampled		16/04/2018
Type of sample		Water
Date prepared	-	19/04/2018
Date analysed	-	19/04/2018
Arsenic-Dissolved	µg/L	<1
Cadmium-Dissolved	µg/L	0.1
Chromium-Dissolved	µg/L	2
Copper-Dissolved	µg/L	1
Lead-Dissolved	µg/L	<1
Mercury-Dissolved	µg/L	<0.05
Nickel-Dissolved	µg/L	33
Zinc-Dissolved	µg/L	60

Method ID	Methodology Summary
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-013	Water samples are analysed directly by purge and trap GC-MS.
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			18/04/2018	[NT]	[NT]	[NT]	[NT]	18/04/2018	[NT]
Date analysed	-			19/04/2018	[NT]	[NT]	[NT]	[NT]	19/04/2018	[NT]
Dichlorodifluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
2,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
1,1,1-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
1,1-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromomethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Bromodichloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
1,2-dibromoethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromoform	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-013	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Styrene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
o-xylene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
1,2,3-trichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-013	94	[NT]	[NT]	[NT]	[NT]	129	[NT]
Surrogate toluene-d8	%		Org-013	93	[NT]	[NT]	[NT]	[NT]	96	[NT]
Surrogate 4-BFB	%		Org-013	91	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			18/04/2018	[NT]	[NT]	[NT]	[NT]	18/04/2018	[NT]
Date analysed	-			19/04/2018	[NT]	[NT]	[NT]	[NT]	19/04/2018	[NT]
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	91	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	86	[NT]
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	90	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-016	94	[NT]	[NT]	[NT]	[NT]	129	[NT]
Surrogate toluene-d8	%		Org-016	93	[NT]	[NT]	[NT]	[NT]	96	[NT]
Surrogate 4-BFB	%		Org-016	91	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			19/04/2018	[NT]	[NT]	[NT]	[NT]	19/04/2018	[NT]
Date analysed	-			20/04/2018	[NT]	[NT]	[NT]	[NT]	20/04/2018	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	124	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	124	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	98	[NT]
Surrogate o-Terphenyl	%		Org-003	100	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: PAHs in Water - Low Level					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			19/04/2018	[NT]	[NT]	[NT]	[NT]	19/04/2018	[NT]
Date analysed	-			20/04/2018	[NT]	[NT]	[NT]	[NT]	20/04/2018	[NT]
Naphthalene	µg/L	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	94	[NT]
Acenaphthylene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	78	[NT]
Phenanthrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	82	[NT]
Anthracene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	79	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	75	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	79	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	78	[NT]	[NT]	[NT]	[NT]	90	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			19/04/2018	[NT]	[NT]	[NT]	[NT]	19/04/2018	[NT]
Date analysed	-			19/04/2018	[NT]	[NT]	[NT]	[NT]	19/04/2018	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	84	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

010451

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 52377 | LABORATORY BATCH NO.:
PROJECT NAME: Perrith | SAMPLERS:
DATE NEEDED BY: Std | QC LEVEL: NEPM (2013)
PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688
SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) Rhammond@jbsg.com.au; (3) .....@jbsg.com.au
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	VTRH	VOC	STRH	PAH (LL)	Metals	BTEX	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/AMA	NOTES:
1	QA20180416	Water	16-4-18	-	4xHCL 40mL Vials	-	X	X				X			
2	QA20180416-1	Water	"	"	1xIL Amber, 100mL NaHSO4	-			X	X	X				

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 189745
Date Received: 18.4.18
Time Received: 13:30
Received By: JE
Temp: Cool/Ambient 11.2°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: Rohan H DATE: 18-4-18	CONSIGNMENT NOTE NO.	NAME: JE	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 18.4.18	
		OF: ELS	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO Forms013 – Chain of Custody - Generic

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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CERTIFICATE OF ANALYSIS 189180

Client Details

Client	JBS & G (NSW & WA) Pty Ltd
Attention	Rohan Hammond
Address	Level 1, 50 Margaret St, Sydney, NSW, 2000

Sample Details

Your Reference	**Penrith**
Number of Samples	4xAir
Date samples received	11/04/2018
Date completed instructions received	11/04/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	18/04/2018
Date of Issue	18/04/2018

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

TO15 in Canisters + ug/m3 calc					
Our Reference		189180-1	189180-2	189180-3	189180-4
Your Reference	UNITS	PC-Bath	PC-Shop	140-Bath	140-Shop
Date Sampled		09/04/2018	09/04/2018	09/04/2018	09/04/2018
Type of sample		air	air	air	air
Air Kit Security No.		334	328	10653	320
Vacuum before Shipment	Hg"	-30	-30	-30	-30
Vacuum before Analysis	Hg"	-4	-10	-3	-5
Date prepared	-	14/04/2018	14/04/2018	14/04/2018	14/04/2018
Date analysed	-	14/04/2018	14/04/2018	14/04/2018	14/04/2018
Propylene	ppbv	3	<0.5	<0.5	<0.5
Dichlorodifluoromethane	ppbv	0.6	0.6	<0.5	0.6
Chloromethane	ppbv	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorotetrafluoroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	ppbv	<0.5	<0.5	<0.5	<0.5
1,3-Butadiene	ppbv	<0.5	<0.5	<0.5	<0.5
Bromomethane	ppbv	<0.5	<0.5	<0.5	<0.5
Chloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Ethanol	ppbv	10	10	11,000	100
Acrolein	ppbv	<0.5	<0.5	<0.5	0.5
Trichlorofluoromethane (Freon 11)	ppbv	<0.5	<0.5	<0.5	<0.5
Acetone	ppbv	8	6	9	9
Isopropyl Alcohol	ppbv	20	<10	<5	<5
1,1-Dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichlorotrifluoroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Methylene chloride (Dichloromethane)	ppbv	<5	<5	<5	<5
Carbon Disulfide	ppbv	<0.5	<0.5	<0.5	<0.5
trans-1,2-dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5
MTBE	ppbv	<0.5	<0.5	<0.5	<0.5
1,1- Dichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Vinyl Acetate	ppbv	<0.5	<0.5	<0.5	<0.5
MEK	ppbv	<0.5	<0.5	<0.5	<0.5
Hexane	ppbv	13	17	9.7	18
cis-1,2-Dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5
Ethyl Acetate	ppbv	0.5	<0.5	0.7	1
Chloroform	ppbv	<0.5	<0.5	2	<0.5
Tetrahydrofuran	ppbv	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Benzene	ppbv	<0.5	<0.5	0.9	0.8
Carbon tetrachloride	ppbv	<0.5	<0.5	<0.5	<0.5
Cyclohexane	ppbv	<0.5	<0.5	<0.5	<0.5

TO15 in Canisters + ug/m3 calc					
Our Reference		189180-1	189180-2	189180-3	189180-4
Your Reference	UNITS	PC-Bath	PC-Shop	140-Bath	140-Shop
Date Sampled		09/04/2018	09/04/2018	09/04/2018	09/04/2018
Type of sample		air	air	air	air
Air Kit Security No.		334	328	10653	320
Heptane	ppbv	<0.5	<0.5	<0.5	<0.5
Trichloroethene	ppbv	<0.5	<0.5	<0.5	3
1,2-Dichloropropane	ppbv	<0.5	<0.5	<0.5	<0.5
1,4-Dioxane	ppbv	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	ppbv	<0.5	<0.5	<0.5	<0.5
Methyl Methacrylate	ppbv	<0.5	<0.5	<0.5	<0.5
MIBK	ppbv	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5	<0.5
Toluene	ppbv	1	1	1	2
1,1,2-Trichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Methyl Butyl Ketone	ppbv	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	ppbv	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	ppbv	1	1	<0.5	0.8
1,2-Dibromoethane	ppbv	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	ppbv	<0.5	<0.5	<0.5	<0.5
m-& p-Xylene	ppbv	<1	<1	<1	2
Styrene	ppbv	<0.5	<0.5	<0.5	<0.5
o-Xylene	ppbv	<0.5	<0.5	<0.5	0.8
Bromoform	ppbv	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
4-ethyl toluene	ppbv	<0.5	<0.5	<0.5	<0.5
1,3,5-Trimethylbenzene	ppbv	<0.5	<0.5	<0.5	0.6
1,2,4-Trimethylbenzene	ppbv	<0.5	<0.5	<0.5	1
1,3-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5
Benzyl chloride	ppbv	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5
Naphthalene	ppbv	<0.5	<0.5	<0.5	<0.5
Hexachloro- 1,3-butadiene	ppbv	<0.5	<0.5	<0.5	<0.5
Surrogate-Bromochloromethane	% rec	103	102	102	100
Surrogate -1,4-Difluorobenzene	% rec	101	100	102	99
Surrogate-Chlorobenzene-D5	% rec	103	103	105	102
Propylene	µg/m^3	5	<0.9	<0.9	<0.9
Dichlorodifluoromethane	µg/m^3	3	3	<2.5	3

TO15 in Canisters + ug/m3 calc					
Our Reference		189180-1	189180-2	189180-3	189180-4
Your Reference	UNITS	PC-Bath	PC-Shop	140-Bath	140-Shop
Date Sampled		09/04/2018	09/04/2018	09/04/2018	09/04/2018
Type of sample		air	air	air	air
Air Kit Security No.		334	328	10653	320
Chloromethane	µg/m³	<1	<1	<1	<1
1,2-Dichlorotetrafluoroethane	µg/m³	<2.5	<2.5	<2.5	<2.5
Vinyl chloride	µg/m³	<1	<1	<1	<1
1,3-Butadiene	µg/m³	<1	<1	<1	<1
Bromomethane	µg/m³	<1.9	<1.9	<1.9	<1.9
Chloroethane	µg/m³	<1	<1	<1	<1
Ethanol	µg/m³	25	20	21,000	200
Acrolein	µg/m³	<1	<1	<1	1
Trichlorofluoromethane	µg/m³	<2.8	<2.8	<2.8	<2.8
Acetone	µg/m³	20	10	20	20
Isopropyl Alcohol	µg/m³	44	<24	<12	<12
1,1-Dichloroethene	µg/m³	<2.0	<2.0	<2.0	<2.0
1,1,2-Trichlorotrifluoroethane	µg/m³	<3.8	<3.8	<3.8	<3.8
Methylene chloride	µg/m³	<17	<17	<17	<17
Carbon Disulfide	µg/m³	<1.6	<1.6	<1.6	<1.6
trans-1,2-dichloroethene	µg/m³	<2.0	<2.0	<2.0	<2.0
MTBE	µg/m³	<1.8	<1.8	<1.8	<1.8
1,1-Dichloroethane	µg/m³	<2.0	<2.0	<2.0	<2.0
Vinyl Acetate	µg/m³	<1.8	<1.8	<1.8	<1.8
MEK	µg/m³	<1.5	<1.5	<1.5	<1.5
Hexane	µg/m³	46	60	34	63
cis-1,2-Dichloroethene	µg/m³	<2.0	<2.0	<2.0	<2.0
Ethyl Acetate	µg/m³	2	<1.8	2	4
Chloroform	µg/m³	<2	<2	10	<2
Tetrahydrofuran	µg/m³	<1.5	<1.5	<1.5	<1.5
1,1,1-Trichloroethane	µg/m³	<2.7	<2.7	<2.7	<2.7
1,2-Dichloroethane	µg/m³	<2	<2	<2	<2
Benzene	µg/m³	<1.6	<1.6	3	2
Carbon tetrachloride	µg/m³	<3	<3	<3	<3
Cyclohexane	µg/m³	<1.7	<1.7	<1.7	<1.7
Heptane	µg/m³	<2.0	<2.0	<2.0	<2.0
Trichloroethene	µg/m³	<2.7	<2.7	<2.7	20
1,2-Dichloropropane	µg/m³	<2	<2	<2	<2
1,4-Dioxane	µg/m³	<1.8	<1.8	<1.8	<1.8
Bromodichloromethane	µg/m³	<3	<3	<3	<3
Methyl Methacrylate	µg/m³	<2.0	<2.0	<2.0	<2.0
MIBK	µg/m³	<2.0	<2.0	<2.0	<2.0

TO15 in Canisters + ug/m3 calc					
Our Reference		189180-1	189180-2	189180-3	189180-4
Your Reference	UNITS	PC-Bath	PC-Shop	140-Bath	140-Shop
Date Sampled		09/04/2018	09/04/2018	09/04/2018	09/04/2018
Type of sample		air	air	air	air
Air Kit Security No.		334	328	10653	320
cis-1,3-Dichloropropene	µg/m³	<2	<2	<2	<2
trans-1,3-Dichloropropene	µg/m³	<2	<2	<2	<2
Toluene	µg/m³	4	5	4	6
1,1,2-Trichloroethane	µg/m³	<2.7	<2.7	<2.7	<2.7
Methyl Butyl Ketone	µg/m³	<2.0	<2.0	<2.0	<2.0
Dibromochloromethane	µg/m³	<1.6	<1.6	<1.6	<1.6
Tetrachloroethene	µg/m³	7	7	<3	5
1,2-Dibromoethane	µg/m³	<3.8	<3.8	<3.8	<3.8
Chlorobenzene	µg/m³	<2	<2	<2	<2
Ethylbenzene	µg/m³	<2	<2	<2	<2
m-& p-Xylene	µg/m³	<4	<4	<4	10
Styrene	µg/m³	<2	<2	<2	<2
o-Xylene	µg/m³	<2	<2	<2	4
Bromoform	µg/m³	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	µg/m³	<3	<3	<3	<3
4-ethyl toluene	µg/m³	<2.5	<2.5	<2.5	<2.5
1,3,5-Trimethylbenzene	µg/m³	<2.5	<2.5	<2.5	3
1,2,4-Trimethylbenzene	µg/m³	<2.5	<2.5	<2.5	5
1,3-Dichlorobenzene	µg/m³	<3.0	<3.0	<3.0	<3.0
Benzyl chloride	µg/m³	<2.6	<2.6	<2.6	<2.6
1,4-Dichlorobenzene	µg/m³	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene	µg/m³	<3.0	<3.0	<3.0	<3.0
1,2,4-Trichlorobenzene	µg/m³	<3.7	<3.7	<3.7	<3.7
Naphthalene	µg/m³	<2.6	<2.6	<2.6	<2.6
Hexachloro-1,3-butadiene	µg/m³	<5	<5	<5	<5

Method ID	Methodology Summary
TO15	USEPA TO15 - Analysis of VOC's in air following USEPA TO15 protocols

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

QUALITY CONTROL: TO15 in Canisters + ug/m3 calc						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Vacuum before Shipment	Hg"			[NT]	1	-30	-30	0	[NT]	[NT]
Vacuum before Analysis	Hg"			[NT]	1	-4	-4	0	[NT]	[NT]
Date prepared	-			14/04/2018	1	14/04/2018	14/04/2018		14/04/2018	[NT]
Date analysed	-			14/04/2018	1	14/04/2018	14/04/2018		14/04/2018	[NT]
Propylene	ppbv	0.5	TO15	<0.5	1	3	3	0	113	[NT]
Dichlorodifluoromethane	ppbv	0.5	TO15	<0.5	1	0.6	0.6	0	[NT]	[NT]
Chloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichlorotetrafluoroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Vinyl chloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,3-Butadiene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Bromomethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethanol	ppbv	5	TO15	<5	1	10	10	0	[NT]	[NT]
Acrolein	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Trichlorofluoromethane (Freon 11)	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Acetone	ppbv	5	TO15	<5	1	8	9	12	[NT]	[NT]
Isopropyl Alcohol	ppbv	5	TO15	<5	1	20	20	0	[NT]	[NT]
1,1-Dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,2-Trichlorotrifluoroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methylene chloride (Dichloromethane)	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	[NT]
Carbon Disulfide	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
trans-1,2-dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MTBE	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1- Dichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Vinyl Acetate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MEK	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Hexane	ppbv	0.5	TO15	<0.5	1	13	13	0	104	[NT]
cis-1,2-Dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethyl Acetate	ppbv	0.5	TO15	<0.5	1	0.5	0.6	18	[NT]	[NT]
Chloroform	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Tetrahydrofuran	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,1-Trichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Benzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	110	[NT]
Carbon tetrachloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Cyclohexane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	98	[NT]
Heptane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	104	[NT]
Trichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]

QUALITY CONTROL: TO15 in Canisters + ug/m3 calc						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
1,2-Dichloropropane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,4-Dioxane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Bromodichloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methyl Methacrylate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MIBK	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
cis-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
trans-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Toluene	ppbv	0.5	TO15	<0.5	1	1	1	0	106	[NT]
1,1,2-Trichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methyl Butyl Ketone	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Dibromochloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Tetrachloroethene	ppbv	0.5	TO15	<0.5	1	1	1	0	[NT]	[NT]
1,2-Dibromoethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	104	[NT]
m-& p-Xylene	ppbv	1	TO15	<1	1	<1	<1	0	106	[NT]
Styrene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	100	[NT]
o-Xylene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	106	[NT]
Bromoform	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,2,2-Tetrachloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
4-ethyl toluene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	98	[NT]
1,3,5-Trimethylbenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	102	[NT]
1,2,4-Trimethylbenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	101	[NT]
1,3-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Benzyl chloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,4-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2,4-Trichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Naphthalene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Hexachloro- 1,3-butadiene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Surrogate-Bromochloromethane	% rec		TO15	100	1	103	103	0	104	[NT]
Surrogate -1,4-Difluorobenzene	% rec		TO15	99	1	101	101	0	104	[NT]
Surrogate-Chlorobenzene-D5	% rec		TO15	100	1	103	104	1	111	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

PQL has been raised for IPA in sample #2 due to interference from analytes (other than those being tested) in the sample/s.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

CANISTER CHAIN OF CUSTODY RECORD

Page 1 of 1

Client Name	RLA SBSRC	Project Contact	Rhamm	Quote No	
Client Address	1, 50 Margaret St, Sydney	Contact Phone No		Date Results Required	1 day / 2 days / 3 days / Standard
Project Name	Peninsula	Contact Mobile No	0430394445	E-mail Report To	RHammond
Site Location	11	Results Required by	Std	PO No	—
		Sampled by	RH		

	Client sample ID (Field location)	Canister #	Soil gas train / Mass flow controller #	Leak Test Passed	PID Reading (ppmv)	Date of Collection	Collection Time		Canister vacuum (Hg")		Analysis requested							
							Time on	Time off	Initial	Final	TO-15	TPH	5-Sulfides	Ozone precursors	general gases *	RGA full list		
1	DC-Bath	0334	03856	✓	0	9-4-18	846	445	-31	-10	X							
2	DC-Shop	0328	03859	✓	0	↓	846	446	-29	-11	X							
3	140-Bath	10693	03845	✓	0		853	450	-33	-2	X							
4	140-Shop	0320	03847	✓	0	↓	853	450	-30	-9	X							

Environlab Services, 12 Ashley St, Chatswood NSW 2067, Ph: (02) 9910 6200

Job No: 189180

Date Received: 11/4/18

Time Received: 12:30

Received by: D.F

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Intact/Broken/None

* Please tick for general gases

1) Methane, oxygen, carbon dioxide, carbon monoxide, nitrogen, or
2) Methane, oxygen, carbon dioxide, carbon monoxide, helium, hydrogen or
3) Specify analytes (NB: If nitrogen and helium/hydrogen are required, please contact ELS.):

Relinquished by		Date & Time		Received by	Lab	Date & Time		Notes:
Print Name	Rhamm	Signature	11-4-18	Print Name	David Fitzgerald	Signature		

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 189771

Client Details

Client	JBS & G (NSW & WA) Pty Ltd
Attention	Rohan Hammond
Address	Level 1, 50 Margaret St, Sydney, NSW, 2000

Sample Details

Your Reference	**Penrith**
Number of Samples	5xAir
Date samples received	18/04/2018
Date completed instructions received	18/04/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	26/04/2018
Date of Issue	23/04/2018

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Chris Guo, Senior Chemist, Air

Authorised By

Jacinta Hurst, Laboratory Manager

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

TO15 in Canisters + ug/m3 calc						
Our Reference		189771-1	189771-2	189771-3	189771-4	189771-5
Your Reference	UNITS	Ambient Outside	DC_Shop	DC_Bath	140_Shop	140_Bath
Date Sampled		17/04/2018	17/04/2018	17/04/2018	17/04/2018	17/04/2018
Type of sample		air	air	air	air	air
Air Kit Security No.		10660	349	321	352	10642
Vacuum before Shipment	Hg"	-29	-30	-30	-30	-30
Vacuum before Analysis	Hg"	-8	-6	-6	-7	-5
Date prepared	-	19/04/2018	19/04/2018	19/04/2018	19/04/2018	19/04/2018
Date analysed	-	19/04/2018	19/04/2018	19/04/2018	19/04/2018	19/04/2018
Propylene	ppbv	2	<0.5	<0.5	2	2
Dichlorodifluoromethane	ppbv	0.6	0.6	0.6	0.6	0.6
Chloromethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorotetrafluoroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,3-Butadiene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Bromomethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Ethanol	ppbv	7	62	340	50	30
Acrolein	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Trichlorofluoromethane (Freon 11)	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Acetone	ppbv	10	7	8	7	10
Isopropyl Alcohol	ppbv	<5	<5	<5	<5	10
1,1-Dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichlorotrifluoroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Methylene chloride (Dichloromethane)	ppbv	<5	<5	<5	<5	<5
Carbon Disulfide	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
MTBE	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1- Dichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl Acetate	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
MEK	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Hexane	ppbv	0.6	0.9	1	0.7	1
cis-1,2-Dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Ethyl Acetate	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroform	ppbv	<0.5	<0.5	0.5	<0.5	0.9
Tetrahydrofuran	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Benzene	ppbv	0.5	0.5	0.6	1	1
Carbon tetrachloride	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Cyclohexane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

TO15 in Canisters + ug/m3 calc						
Our Reference		189771-1	189771-2	189771-3	189771-4	189771-5
Your Reference	UNITS	Ambient Outside	DC_Shop	DC_Bath	140_Shop	140_Bath
Date Sampled		17/04/2018	17/04/2018	17/04/2018	17/04/2018	17/04/2018
Type of sample		air	air	air	air	air
Air Kit Security No.		10660	349	321	352	10642
Heptane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dioxane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Methyl Methacrylate	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
MIBK	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene	ppbv	0.8	1	1	1	1
1,1,2-Trichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Methyl Butyl Ketone	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	ppbv	<0.5	0.6	0.6	<0.5	<0.5
Tetrachloroethene	ppbv	<0.5	1	1	<0.5	<0.5
1,2-Dibromoethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	ppbv	<0.5	<0.5	2	<0.5	<0.5
m-& p-Xylene	ppbv	<1	<1	3	<1	<1
Styrene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
o-Xylene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoform	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
4-ethyl toluene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,3,5-Trimethylbenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-Trimethylbenzene	ppbv	<0.5	<0.5	0.8	1	<0.5
1,3-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Benzyl chloride	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Naphthalene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Hexachloro- 1,3-butadiene	ppbv	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate-Bromochloromethane	% rec	107	105	102	103	99
Surrogate -1,4-Difluorobenzene	% rec	104	102	101	99.7	98
Surrogate-Chlorobenzene-D5	% rec	105	104	103	101	99.5
Propylene	µg/m^3	3	<0.9	<0.9	3	3
Dichlorodifluoromethane	µg/m^3	3	3	3	3	3

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

TO15 in Canisters + ug/m3 calc						
Our Reference		189771-1	189771-2	189771-3	189771-4	189771-5
Your Reference	UNITS	Ambient Outside	DC_Shop	DC_Bath	140_Shop	140_Bath
Date Sampled		17/04/2018	17/04/2018	17/04/2018	17/04/2018	17/04/2018
Type of sample		air	air	air	air	air
Air Kit Security No.		10660	349	321	352	10642
Chloromethane	µg/m³	<1	<1	<1	<1	<1
1,2-Dichlorotetrafluoroethane	µg/m³	<2.5	<2.5	<2.5	<2.5	<2.5
Vinyl chloride	µg/m³	<1	<1	<1	<1	<1
1,3-Butadiene	µg/m³	<1	<1	<1	<1	<1
Bromomethane	µg/m³	<1.9	<1.9	<1.9	<1.9	<1.9
Chloroethane	µg/m³	<1	<1	<1	<1	<1
Ethanol	µg/m³	12	120	650	88	57
Acrolein	µg/m³	<1	<1	<1	<1	<1
Trichlorofluoromethane	µg/m³	<2.8	<2.8	<2.8	<2.8	<2.8
Acetone	µg/m³	30	20	20	20	20
Isopropyl Alcohol	µg/m³	<12	<12	<12	<12	28
1,1-Dichloroethene	µg/m³	<2.0	<2.0	<2.0	<2.0	<2.0
1,1,2-Trichlorotrifluoroethane	µg/m³	<3.8	<3.8	<3.8	<3.8	<3.8
Methylene chloride	µg/m³	<17	<17	<17	<17	<17
Carbon Disulfide	µg/m³	<1.6	<1.6	<1.6	<1.6	<1.6
trans-1,2-dichloroethene	µg/m³	<2.0	<2.0	<2.0	<2.0	<2.0
MTBE	µg/m³	<1.8	<1.8	<1.8	<1.8	<1.8
1,1-Dichloroethane	µg/m³	<2.0	<2.0	<2.0	<2.0	<2.0
Vinyl Acetate	µg/m³	<1.8	<1.8	<1.8	<1.8	<1.8
MEK	µg/m³	<1.5	<1.5	<1.5	<1.5	<1.5
Hexane	µg/m³	2	3	4	2	4
cis-1,2-Dichloroethene	µg/m³	<2.0	<2.0	<2.0	<2.0	<2.0
Ethyl Acetate	µg/m³	<1.8	<1.8	<1.8	<1.8	<1.8
Chloroform	µg/m³	<2	<2	2	<2	4
Tetrahydrofuran	µg/m³	<1.5	<1.5	<1.5	<1.5	<1.5
1,1,1-Trichloroethane	µg/m³	<2.7	<2.7	<2.7	<2.7	<2.7
1,2-Dichloroethane	µg/m³	<2	<2	<2	<2	<2
Benzene	µg/m³	2	2	2	4	3
Carbon tetrachloride	µg/m³	<3	<3	<3	<3	<3
Cyclohexane	µg/m³	<1.7	<1.7	<1.7	<1.7	<1.7
Heptane	µg/m³	<2.0	<2.0	<2.0	<2.0	<2.0
Trichloroethene	µg/m³	<2.7	<2.7	<2.7	<2.7	<2.7
1,2-Dichloropropane	µg/m³	<2	<2	<2	<2	<2
1,4-Dioxane	µg/m³	<1.8	<1.8	<1.8	<1.8	<1.8
Bromodichloromethane	µg/m³	<3	<3	<3	<3	<3
Methyl Methacrylate	µg/m³	<2.0	<2.0	<2.0	<2.0	<2.0
MIBK	µg/m³	<2.0	<2.0	<2.0	<2.0	<2.0

TO15 in Canisters + ug/m3 calc						
Our Reference		189771-1	189771-2	189771-3	189771-4	189771-5
Your Reference	UNITS	Ambient Outside	DC_Shop	DC_Bath	140_Shop	140_Bath
Date Sampled		17/04/2018	17/04/2018	17/04/2018	17/04/2018	17/04/2018
Type of sample		air	air	air	air	air
Air Kit Security No.		10660	349	321	352	10642
cis-1,3-Dichloropropene	µg/m³	<2	<2	<2	<2	<2
trans-1,3-Dichloropropene	µg/m³	<2	<2	<2	<2	<2
Toluene	µg/m³	3	4	4	4	5
1,1,2-Trichloroethane	µg/m³	<2.7	<2.7	<2.7	<2.7	<2.7
Methyl Butyl Ketone	µg/m³	<2.0	<2.0	<2.0	<2.0	<2.0
Dibromochloromethane	µg/m³	<1.6	2	2	<1.6	<1.6
Tetrachloroethene	µg/m³	<3	8	8	<3	<3
1,2-Dibromoethane	µg/m³	<3.8	<3.8	<3.8	<3.8	<3.8
Chlorobenzene	µg/m³	<2	<2	<2	<2	<2
Ethylbenzene	µg/m³	<2	<2	7	<2	<2
m-& p-Xylene	µg/m³	<4	<4	20	<4	<4
Styrene	µg/m³	<2	<2	<2	<2	<2
o-Xylene	µg/m³	<2	<2	<2	<2	<2
Bromoform	µg/m³	<5	<5	<5	<5	<5
1,1,2,2-Tetrachloroethane	µg/m³	<3	<3	<3	<3	<3
4-ethyl toluene	µg/m³	<2.5	<2.5	<2.5	<2.5	<2.5
1,3,5-Trimethylbenzene	µg/m³	<2.5	<2.5	<2.5	<2.5	<2.5
1,2,4-Trimethylbenzene	µg/m³	<2.5	<2.5	4	7	<2.5
1,3-Dichlorobenzene	µg/m³	<3.0	<3.0	<3.0	<3.0	<3.0
Benzyl chloride	µg/m³	<2.6	<2.6	<2.6	<2.6	<2.6
1,4-Dichlorobenzene	µg/m³	<3.0	<3.0	<3.0	<3.0	<3.0
1,2-Dichlorobenzene	µg/m³	<3.0	<3.0	<3.0	<3.0	<3.0
1,2,4-Trichlorobenzene	µg/m³	<3.7	<3.7	<3.7	<3.7	<3.7
Naphthalene	µg/m³	<2.6	<2.6	<2.6	<2.6	<2.6
Hexachloro-1,3-butadiene	µg/m³	<5	<5	<5	<5	<5

Method ID	Methodology Summary
TO15	USEPA TO15 - Analysis of VOC's in air following USEPA TO15 protocols

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

QUALITY CONTROL: TO15 in Canisters + ug/m3 calc						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Vacuum before Shipment	Hg"			[NT]	5	-30	-30	0	[NT]	[NT]
Vacuum before Analysis	Hg"			[NT]	5	-5	-5	0	[NT]	[NT]
Date prepared	-			19/04/2018	5	19/04/2018	19/04/2018		19/04/2018	[NT]
Date analysed	-			19/04/2018	5	19/04/2018	19/04/2018		19/04/2018	[NT]
Propylene	ppbv	0.5	TO15	<0.5	5	2	2	0	113	[NT]
Dichlorodifluoromethane	ppbv	0.5	TO15	<0.5	5	0.6	0.6	0	[NT]	[NT]
Chloromethane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichlorotetrafluoroethane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Vinyl chloride	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
1,3-Butadiene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Bromomethane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Chloroethane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Ethanol	ppbv	5	TO15	<5	5	30	30	0	[NT]	[NT]
Acrolein	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Trichlorofluoromethane (Freon 11)	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Acetone	ppbv	5	TO15	<5	5	10	9	11	[NT]	[NT]
Isopropyl Alcohol	ppbv	5	TO15	<5	5	10	10	0	[NT]	[NT]
1,1-Dichloroethene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
1,1,2-Trichlorotrifluoroethane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Methylene chloride (Dichloromethane)	ppbv	5	TO15	<5	5	<5	<5	0	[NT]	[NT]
Carbon Disulfide	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
trans-1,2-dichloroethene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
MTBE	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
1,1- Dichloroethane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Vinyl Acetate	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
MEK	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Hexane	ppbv	0.5	TO15	<0.5	5	1	1	0	104	[NT]
cis-1,2-Dichloroethene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Ethyl Acetate	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Chloroform	ppbv	0.5	TO15	<0.5	5	0.9	0.8	12	[NT]	[NT]
Tetrahydrofuran	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
1,1,1-Trichloroethane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichloroethane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Benzene	ppbv	0.5	TO15	<0.5	5	1	1	0	110	[NT]
Carbon tetrachloride	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Cyclohexane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	98	[NT]
Heptane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	104	[NT]
Trichloroethene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]

QUALITY CONTROL: TO15 in Canisters + ug/m3 calc					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
1,2-Dichloropropane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
1,4-Dioxane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Bromodichloromethane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Methyl Methacrylate	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
MIBK	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
cis-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
trans-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Toluene	ppbv	0.5	TO15	<0.5	5	1	1	0	106	[NT]
1,1,2-Trichloroethane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Methyl Butyl Ketone	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Dibromochloromethane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Tetrachloroethene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
1,2-Dibromoethane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Chlorobenzene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	104	[NT]
m-& p-Xylene	ppbv	1	TO15	<1	5	<1	<1	0	106	[NT]
Styrene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	100	[NT]
o-Xylene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	106	[NT]
Bromoform	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
1,1,2,2-Tetrachloroethane	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
4-ethyl toluene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	98	[NT]
1,3,5-Trimethylbenzene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	102	[NT]
1,2,4-Trimethylbenzene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	101	[NT]
1,3-Dichlorobenzene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Benzyl chloride	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
1,4-Dichlorobenzene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichlorobenzene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
1,2,4-Trichlorobenzene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Naphthalene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Hexachloro- 1,3-butadiene	ppbv	0.5	TO15	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Surrogate-Bromochloromethane	% rec		TO15	100	5	99	101	2	104	[NT]
Surrogate -1,4-Difluorobenzene	% rec		TO15	99	5	98	99	1	104	[NT]
Surrogate-Chlorobenzene-D5	% rec		TO15	100	5	99.5	101	1	111	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

850

ENVIROLAB

CANISTER CHAIN OF CUSTODY RECORD

Page 1 of 1

Client Name	JBS&G	Project Contact	ROHAN	Quote No	-
Client Address		Contact Phone No	0430379445	Date Results Required	1 day / 2 days / 3 days / Standard
		Contact Mobile No			
Project Name	Penrith	Results Required by	Std	E-mail Report To	RHammond@jbsg.com.au
Site Location	11	Sampled by	RH & CB	PO No	

	Client sample ID (Field location)	Canister #	Soil gas train / Mass flow controller #	Leak Test Passed	PID Reading (ppmv)	Date of Collection	Collection Time		Canister vacuum (Hg")		Analysis requested							
							Time on	Time off	Initial	Final	TO-15	TPH	5-Sulfides	Ozone precursors	general gases *	RGA full list		
1	Ambient Outside	10660	1765	Y	0	17-4-18	845	445	-30	-8	X							
2	DC - SHOP	0349	1757	Y	0		855	455	-30	-9	X							
3	DC - BATH	0321	1771	Y	0		855	455	-30	-9	X							
4	140 - SHOP	0352	1767	Y	0		850	450	-30	-6	X							
5	140 - BATH	10642	1761	Y	0		856	456	-30	-6	X							

ENVIROLAB Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 189771

Date Received: 18/4/18
Time Received: 16:15
Received By: D.F.
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

* Please tick for general gases

1) Methane, oxygen, carbon dioxide, carbon monoxide, nitrogen, or
2) Methane, oxygen, carbon dioxide, carbon monoxide, helium, hydrogen or
3) Specify analytes (NB: If nitrogen and helium/hydrogen are required, please contact ELS.):

Relinquished by		Date & Time	17-4-18	Received by	Lab	Date & Time	18/4/18	Notes:
Print Name	Rohan Hammond	Signature		Print Name	Daniel Ford	Signature	16:15	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Envirolab Services Pty Ltd
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customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 191187

Client Details

Client	JBS & G (NSW & WA) Pty Ltd
Attention	Rohan Hammond
Address	Level 1, 50 Margaret St, Sydney, NSW, 2000

Sample Details

Your Reference	**Penrith**
Number of Samples	1xAir
Date samples received	09/05/2018
Date completed instructions received	09/05/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	11/05/2018
Date of Issue	11/05/2018

NATA Accreditation Number 2901. This document shall not be reproduced except in full.

Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Chris Guo, Senior Chemist, Air

Authorised By

Jacinta Hurst, Laboratory Manager

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

TO15 in Canisters + ug/m3 calc		
Our Reference		191187-1
Your Reference	UNITS	140_Shop
Date Sampled		09/05/2018
Type of sample		1xAir
Air Kit Security No.		320
Vacuum before Shipment	Hg"	-30
Vacuum before Analysis	Hg"	-6
Date prepared	-	11/05/2018
Date analysed	-	11/05/2018
Propylene	ppbv	<0.5
Dichlorodifluoromethane	ppbv	0.6
Chloromethane	ppbv	<0.5
1,2-Dichlorotetrafluoroethane	ppbv	<0.5
Vinyl chloride	ppbv	<0.5
1,3-Butadiene	ppbv	<0.5
Bromomethane	ppbv	<0.5
Chloroethane	ppbv	<0.5
Ethanol	ppbv	40
Acrolein	ppbv	<0.5
Trichlorofluoromethane (Freon 11)	ppbv	<0.5
Acetone	ppbv	5
Isopropyl Alcohol	ppbv	<5
1,1-Dichloroethene	ppbv	<0.5
1,1,2-Trichlorotrifluoroethane	ppbv	<0.5
Methylene chloride (Dichloromethane)	ppbv	<5
Carbon Disulfide	ppbv	<0.5
trans-1,2-dichloroethene	ppbv	<0.5
MTBE	ppbv	<0.5
1,1- Dichloroethane	ppbv	<0.5
Vinyl Acetate	ppbv	<0.5
MEK	ppbv	<0.5
Hexane	ppbv	0.8
cis-1,2-Dichloroethene	ppbv	<0.5
Ethyl Acetate	ppbv	<0.5
Chloroform	ppbv	<0.5
Tetrahydrofuran	ppbv	<0.5
1,1,1-Trichloroethane	ppbv	<0.5
1,2-Dichloroethane	ppbv	<0.5
Benzene	ppbv	1
Carbon tetrachloride	ppbv	<0.5
Cyclohexane	ppbv	1

TO15 in Canisters + ug/m3 calc		
Our Reference		191187-1
Your Reference	UNITS	140_Shop
Date Sampled		09/05/2018
Type of sample		1xAir
Air Kit Security No.		320
Heptane	ppbv	<0.5
Trichloroethene	ppbv	0.9
1,2-Dichloropropane	ppbv	<0.5
1,4-Dioxane	ppbv	<0.5
Bromodichloromethane	ppbv	<0.5
Methyl Methacrylate	ppbv	<0.5
MIBK	ppbv	<0.5
cis-1,3-Dichloropropene	ppbv	<0.5
trans-1,3-Dichloropropene	ppbv	<0.5
Toluene	ppbv	4
1,1,2-Trichloroethane	ppbv	<0.5
Methyl Butyl Ketone	ppbv	<0.5
Dibromochloromethane	ppbv	<0.5
Tetrachloroethene	ppbv	0.6
1,2-Dibromoethane	ppbv	<0.5
Chlorobenzene	ppbv	<0.5
Ethylbenzene	ppbv	0.6
m-& p-Xylene	ppbv	2
Styrene	ppbv	0.6
o-Xylene	ppbv	0.7
Bromoform	ppbv	<0.5
1,1,2,2-Tetrachloroethane	ppbv	<0.5
4-ethyl toluene	ppbv	<0.5
1,3,5-Trimethylbenzene	ppbv	<0.5
1,2,4-Trimethylbenzene	ppbv	<0.5
1,3-Dichlorobenzene	ppbv	<0.5
Benzyl chloride	ppbv	<0.5
1,4-Dichlorobenzene	ppbv	<0.5
1,2-Dichlorobenzene	ppbv	<0.5
1,2,4-Trichlorobenzene	ppbv	<0.5
Naphthalene	ppbv	<0.5
Hexachloro- 1,3-butadiene	ppbv	<0.5
Surrogate-Bromochloromethane	% rec	94
Surrogate -1,4-Difluorobenzene	% rec	98
Surrogate-Chlorobenzene-D5	% rec	99
Propylene	µg/m^3	<0.9
Dichlorodifluoromethane	µg/m^3	3

TO15 in Canisters + ug/m3 calc		
Our Reference		191187-1
Your Reference	UNITS	140_Shop
Date Sampled		09/05/2018
Type of sample		1xAir
Air Kit Security No.		320
Chloromethane	µg/m³	<1
1,2-Dichlorotetrafluoroethane	µg/m³	<2.5
Vinyl chloride	µg/m³	<1
1,3-Butadiene	µg/m³	<1
Bromomethane	µg/m³	<1.9
Chloroethane	µg/m³	<1
Ethanol	µg/m³	72
Acrolein	µg/m³	<1
Trichlorofluoromethane	µg/m³	<2.8
Acetone	µg/m³	10
Isopropyl Alcohol	µg/m³	<12
1,1-Dichloroethene	µg/m³	<2.0
1,1,2-Trichlorotrifluoroethane	µg/m³	<3.8
Methylene chloride	µg/m³	<17
Carbon Disulfide	µg/m³	<1.6
trans-1,2-dichloroethene	µg/m³	<2.0
MTBE	µg/m³	<1.8
1,1-Dichloroethane	µg/m³	<2.0
Vinyl Acetate	µg/m³	<1.8
MEK	µg/m³	<1.5
Hexane	µg/m³	3
cis-1,2-Dichloroethene	µg/m³	<2.0
Ethyl Acetate	µg/m³	<1.8
Chloroform	µg/m³	<2
Tetrahydrofuran	µg/m³	<1.5
1,1,1-Trichloroethane	µg/m³	<2.7
1,2-Dichloroethane	µg/m³	<2
Benzene	µg/m³	4
Carbon tetrachloride	µg/m³	<3
Cyclohexane	µg/m³	3
Heptane	µg/m³	<2.0
Trichloroethene	µg/m³	5
1,2-Dichloropropane	µg/m³	<2
1,4-Dioxane	µg/m³	<1.8
Bromodichloromethane	µg/m³	<3
Methyl Methacrylate	µg/m³	<2.0
MIBK	µg/m³	<2.0

TO15 in Canisters + ug/m3 calc		
Our Reference		191187-1
Your Reference	UNITS	140_Shop
Date Sampled		09/05/2018
Type of sample		1xAir
Air Kit Security No.		320
cis-1,3-Dichloropropene	µg/m³	<2
trans-1,3-Dichloropropene	µg/m³	<2
Toluene	µg/m³	10
1,1,2-Trichloroethane	µg/m³	<2.7
Methyl Butyl Ketone	µg/m³	<2.0
Dibromochloromethane	µg/m³	<1.6
Tetrachloroethene	µg/m³	4
1,2-Dibromoethane	µg/m³	<3.8
Chlorobenzene	µg/m³	<2
Ethylbenzene	µg/m³	2
m-& p-Xylene	µg/m³	8
Styrene	µg/m³	2
o-Xylene	µg/m³	3
Bromoform	µg/m³	<5
1,1,2,2-Tetrachloroethane	µg/m³	<3
4-ethyl toluene	µg/m³	<2.5
1,3,5-Trimethylbenzene	µg/m³	<2.5
1,2,4-Trimethylbenzene	µg/m³	<2.5
1,3-Dichlorobenzene	µg/m³	<3.0
Benzyl chloride	µg/m³	<2.6
1,4-Dichlorobenzene	µg/m³	<3.0
1,2-Dichlorobenzene	µg/m³	<3.0
1,2,4-Trichlorobenzene	µg/m³	<3.7
Naphthalene	µg/m³	<2.6
Hexachloro-1,3-butadiene	µg/m³	<5

Method ID	Methodology Summary
TO15	USEPA TO15 - Analysis of VOC's in air following USEPA TO15 protocols

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

QUALITY CONTROL: TO15 in Canisters + ug/m3 calc						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Vacuum before Shipment	Hg"			[NT]	1	-30	-30	0	[NT]	[NT]
Vacuum before Analysis	Hg"			[NT]	1	-6	-6	0	[NT]	[NT]
Date prepared	-			11/05/2018	1	11/05/2018	11/05/2018		11/05/2018	[NT]
Date analysed	-			11/05/2018	1	11/05/2018	11/05/2018		11/05/2018	[NT]
Propylene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Dichlorodifluoromethane	ppbv	0.5	TO15	<0.5	1	0.6	0.5	18	[NT]	[NT]
Chloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichlorotetrafluoroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Vinyl chloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,3-Butadiene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Bromomethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethanol	ppbv	5	TO15	<5	1	40	40	0	[NT]	[NT]
Acrolein	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Trichlorofluoromethane (Freon 11)	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Acetone	ppbv	5	TO15	<5	1	5	<5	0	[NT]	[NT]
Isopropyl Alcohol	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	[NT]
1,1-Dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,2-Trichlorotrifluoroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methylene chloride (Dichloromethane)	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	[NT]
Carbon Disulfide	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
trans-1,2-dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MTBE	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1- Dichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Vinyl Acetate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MEK	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Hexane	ppbv	0.5	TO15	<0.5	1	0.8	0.8	0	98	[NT]
cis-1,2-Dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethyl Acetate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chloroform	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Tetrahydrofuran	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,1-Trichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Benzene	ppbv	0.5	TO15	<0.5	1	1	1	0	101	[NT]
Carbon tetrachloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Cyclohexane	ppbv	0.5	TO15	<0.5	1	1	1	0	96	[NT]
Heptane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Trichloroethene	ppbv	0.5	TO15	<0.5	1	0.9	0.7	25	89	[NT]

QUALITY CONTROL: TO15 in Canisters + ug/m3 calc						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
1,2-Dichloropropane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,4-Dioxane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Bromodichloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methyl Methacrylate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MIBK	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
cis-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
trans-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Toluene	ppbv	0.5	TO15	<0.5	1	4	4	0	95	[NT]
1,1,2-Trichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methyl Butyl Ketone	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Dibromochloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Tetrachloroethene	ppbv	0.5	TO15	<0.5	1	0.6	0.6	0	[NT]	[NT]
1,2-Dibromoethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	ppbv	0.5	TO15	<0.5	1	0.6	0.6	0	102	[NT]
m-& p-Xylene	ppbv	1	TO15	<1	1	2	2	0	104	[NT]
Styrene	ppbv	0.5	TO15	<0.5	1	0.6	0.6	0	98	[NT]
o-Xylene	ppbv	0.5	TO15	<0.5	1	0.7	0.7	0	101	[NT]
Bromoform	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,2,2-Tetrachloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
4-ethyl toluene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	95	[NT]
1,3,5-Trimethylbenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	100	[NT]
1,2,4-Trimethylbenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	100	[NT]
1,3-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Benzyl chloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,4-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2,4-Trichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Naphthalene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Hexachloro- 1,3-butadiene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Surrogate-Bromochloromethane	% rec		TO15	88	1	94	94	0	113	[NT]
Surrogate -1,4-Difluorobenzene	% rec		TO15	99	1	98	96	2	101	[NT]
Surrogate-Chlorobenzene-D5	% rec		TO15	95	1	99	97	2	106	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

CANISTER CHAIN OF CUSTODY RECORD

Page 1 of 7

Client Name	JBSLG	Project Contact	Rohan H	Quote No	—
Client Address	1, 50 Margaret St Sydney	Contact Phone No		Date Results Required	1 day / 2 days / 3 days / ~~Standard~~ 4 Days
Project Name	Penrith	Contact Mobile No	0430 379445		
Site Location	11	Results Required by	~~COB~~ 11-5-18	E-mail Report To	—
		Sampled by	Rohan H	PO No	—

	Client sample ID (Field location)	Canister #	Soil gas train / Mass flow controller #	Leak Test Passed	PID Reading (ppmv)	Date of Collection	Collection Time		Canister vacuum (Hg")		Analysis requested							
							Time on	Time off	Initial	Final	TO-15	TPH	5-Sulfides	Ozone precursors	general gases *	RGA full list		
1.	140_SHOP	320	1764	Y	0	3-5-18	845	445	-30	-16	X							

Environlab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 191187
Date Received: 9/5/18
Time Received: 15:00
Received by: D.F
Temp: Cool/Ambient
Cooling: Ice/icepack
Security: Intact/Broken/None

* Please tick for general gases

1) Methane, oxygen, carbon dioxide, carbon monoxide, nitrogen, or
2) Methane, oxygen, carbon dioxide, carbon monoxide, helium, hydrogen or
3) Specify analytes (NB: If nitrogen and helium/hydrogen are required, please contact ELS.):

Relinquished by		Date & Time		Received by	Lab	Date & Time	Notes:
Print Name	Rohan H	Signature		Print Name	Daniel Ford	Signature	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

016612

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 55073
PROJECT NAME: Penrith
DATE NEEDED BY: ST TAT

LABORATORY BATCH NO.:
SAMPLERS: CB
QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) rhammond@jbsg.com.au; (3) chemeth@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Hold	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
MWSV 0.3-0.4	Soil	5.11.18		J+B		X			
0.5-0.6				↓					
0.9-1.0				↓					
1.9-2.0				J					
2.9-3.0				↓					
3.9-4.0				↓					
4.9-5.0				↓					
5.9-6.0				↓					
6.9-7.0				J+S					
7.9-8.0				J+B					
TS	Water			Vials					
TB									
Rinsate				Amber, Metal, Vials					

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: CB DATE: 5/11/18	CONSIGNMENT NOTE NO.	NAME: RJM DATE: 5/11/18 5:39	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	OF:	COOLER TEMP ..... deg C 3.5°C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody - Generic

#626517

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Enviro Sample NSW

To: Nibha Vaidya
Subject: RE: 55073 - Penrith

-------- Original message --------
From: Rohan Hammond <RHammond@jbsg.com.au>
Date: 7/11/18 1:44 pm (GMT+10:00)
To: Charl Du Preez <CharlDuPreez@eurofins.com>, Nibha Vaidya <NibhaVaidya@eurofins.com>
Subject: 55073 - Penrith

EXTERNAL EMAIL*

Hi guys,

For the lab batch submitted to you on Monday, can you please schedule:

Total organic carbon fraction on MWSV 6.9-7.0 and MWSV 7.9-8.0.

Rohan.

Rohan Hammond | Environmental Consultant | JBS&G
Sydney | Melbourne | Adelaide | Perth | Brisbane | Canberra | Darwin | Wollongong
Level 1, 50 Margaret Street Sydney NSW 2000
T: 02 8245 0300 | M: 0430 379 445| E: rhammond@jbsg.com.au | W: www.jbsg.com.au
Contaminated Land | Groundwater Remediation | Auditing and Compliance | Assessments and Approvals | Occupational Hygiene and Monitoring

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NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Rohan Hammond
Project name: PENRITH
Project ID: 55073
COC number: Not provided
Turn around time: 5 Day
Date/Time received: Nov 7, 2018 5:39 PM
Eurofins | mgt reference: **626517**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 3.6 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Notes

Samples TS (x2 vials) received broken. Sample TB (1 vial) received broken.

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Rohan Hammond - rhammond@jbsg.com.au.

Note: A copy of these results will also be delivered to the general JBS & G Australia (NSW) P/L email address.

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web : www.eurofins.com.au

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NATA # 1261
Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 55073

Order No.:
Report #: 626517
Phone: 02 8245 0300
Fax:

Received: Nov 7, 2018 5:39 PM
Due: Nov 14, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						CANCELLED	HOLD	Total Organic Carbon	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**				
1	MWSV 0.3-0.4	Nov 05, 2018		Soil	S18-No09069		X		
2	MWSV 0.5-0.6	Nov 05, 2018		Soil	S18-No09070		X		
3	MWSV 0.9-1.0	Nov 05, 2018		Soil	S18-No09071		X		
4	MWSV 1.9-2.0	Nov 05, 2018		Soil	S18-No09072		X		
5	MWSV 2.9-3.0	Nov 05, 2018		Soil	S18-No09073		X		
6	MWSV 3.9-4.0	Nov 05, 2018		Soil	S18-No09074		X		
7	MWSV 4.9-5.0	Nov 05, 2018		Soil	S18-No09075		X		
8	MWSV 5.9-6.0	Nov 05, 2018		Soil	S18-No09076		X		
9	MWSV 6.9-7.0	Nov 05, 2018		Soil	S18-No09077			X	X

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web : www.eurofins.com.au

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Fax:

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Due: Nov 14, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						CANCELLED	HOLD	Total Organic Carbon	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
10	MWSV 7.9-8.0	Nov 05, 2018		Soil	S18-No09078			X	X
11	TS	Nov 05, 2018		Water	S18-No09079	X			
12	TB	Nov 05, 2018		Water	S18-No09080		X		
13	RINSATE	Nov 05, 2018		Water	S18-No09081		X		
Test Counts						1	10	2	2

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Certificate of Analysis

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

Attention: **Rohan Hammond**

Report **626517-S**
Project name PENRITH
Project ID 55073
Received Date Nov 07, 2018

Client Sample ID			**MWSV 6.9-7.0**	**MWSV 7.9-8.0**
Sample Matrix			**Soil**	**Soil**
Eurofins | mgt Sample No.			**S18-No09077**	**S18-No09078**
Date Sampled			**Nov 05, 2018**	**Nov 05, 2018**
Test/Reference	LOR	Unit		
Total Organic Carbon	0.1	%	0.1	0.4
% Moisture	1	%	11	11

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Version: 1, Version Date: 14/04/2021

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Total Organic Carbon	Melbourne	Nov 12, 2018	28 Day
- Method: APHA 5310B Total Organic Carbon			
% Moisture	Melbourne	Nov 08, 2018	14 Day
- Method: LTM-GEN-7080 Moisture			

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 55073

Order No.:
Report #: 626517
Phone: 02 8245 0300
Fax:

Received: Nov 7, 2018 5:39 PM
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Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						CANCELLED	HOLD	Total Organic Carbon	Moisture Set
Melbourne Laboratory - NATA Site # 1254 & 14271							X	X	X
Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
External Laboratory									
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2	MWSV 0.5-0.6	Nov 05, 2018		Soil	S18-No09070		X		
3	MWSV 0.9-1.0	Nov 05, 2018		Soil	S18-No09071		X		
4	MWSV 1.9-2.0	Nov 05, 2018		Soil	S18-No09072		X		
5	MWSV 2.9-3.0	Nov 05, 2018		Soil	S18-No09073		X		
6	MWSV 3.9-4.0	Nov 05, 2018		Soil	S18-No09074		X		
7	MWSV 4.9-5.0	Nov 05, 2018		Soil	S18-No09075		X		
8	MWSV 5.9-6.0	Nov 05, 2018		Soil	S18-No09076		X		
9	MWSV 6.9-7.0	Nov 05, 2018		Soil	S18-No09077			X	X

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Sydney Laboratory - NATA Site # 18217						X			
Brisbane Laboratory - NATA Site # 20794									
Perth Laboratory - NATA Site # 23736									
10	MWSV 7.9-8.0	Nov 05, 2018		Soil	S18-No09078			X	X
11	TS	Nov 05, 2018		Water	S18-No09079	X			
12	TB	Nov 05, 2018		Water	S18-No09080		X		
13	RINSATE	Nov 05, 2018		Water	S18-No09081		X		
Test Counts						1	10	2	2

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Organic Carbon	%	< 0.1			0.1	Pass	
LCS - % Recovery							
Total Organic Carbon	%	91			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
				Result 1	Result 2	RPD			
Total Organic Carbon	S18-No09077	CP	%	0.1	0.2	21	30%	Pass	
% Moisture	S18-No09099	NCP	%	15	15	2.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Nibha Vaidya	Analytical Services Manager
Julie Kay	Senior Analyst-Inorganic (VIC)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

016621

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 55073
PROJECT NAME: Penrith
DATE NEEDED BY: Std TAT
LABORATORY BATCH NO.:
SAMPLERS: CB
QC LEVEL: NEPM (2013)
PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688
SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) Rhammond@jbsg.com.au; (3) cbennett@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

627998

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	VOC 8260	VOCs	MNA *	BTEX	Isopropanol	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
JBMW02	Water	15.11.18		8x Vial, 1x plastic, 1x glass, 1x Ferrous Iron			X	X					*
JBMW05	↓	↓		↓			X	X					Sulfate
DSM01							X	X					Nitrate
QA151118							X	X					chloride
RIN151118				2xV, 1xM, 1xA			X						Ferrous Iron
SV18	Carbon			Carbon tube		X				X			Methane
SV19	↓			↓		X				X			Ethene
QA-V	↓			↓		X				X			Ethane
TS	water			Vials					X				pH
TB	water	↓		Vials					X				TOC
MB	Carbon	↓		carbon tube		X				X			Alkalinity

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: CB DATE: 15.11.18	CONSIGNMENT NOTE NO.	NAME: Elvis DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	OF:	COOLER TEMP 5.23 deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody - Generic

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Rohan Hammond
Project name: PENRITH
Project ID: 55073
COC number: 016621
Turn around time: 5 Day
Date/Time received: Nov 15, 2018 6:15 PM
Eurofins | mgt reference: **627998**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 5.2 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Rohan Hammond - rhammond@jbsg.com.au.

Note: A copy of these results will also be delivered to the general JBS & G Australia (NSW) P/L email address.

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
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NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 55073

Order No.:
Report #: 627998
Phone: 02 8245 0300
Fax:

Received: Nov 15, 2018 6:15 PM
Due: Nov 22, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Chloride	Ethane*	Ethylene*	Ferrous Iron - Fe2+	Isopropanol	Methane	Nitrate (as N)	pH (at 25°C)	Sulphate (as SO4)	Total Alkalinity (as CaCO3)	Total Organic Carbon	BTEX	Volatile Organics	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																			
Brisbane Laboratory - NATA Site # 20794																			
Perth Laboratory - NATA Site # 23736																			
External Laboratory																			
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**														
1	JBMW02	Nov 15, 2018		Water	S18-No20418	X	X	X	X		X	X	X	X	X	X		X	
2	JBMW05	Nov 15, 2018		Water	S18-No20419	X	X	X	X		X	X	X	X	X	X		X	
3	PSM01	Nov 15, 2018		Water	S18-No20420	X	X	X	X		X	X	X	X	X	X		X	
4	QA151118	Nov 15, 2018		Water	S18-No20421	X	X	X	X		X	X	X	X	X	X		X	
5	RIN151118	Nov 15, 2018		Water	S18-No20422													X	
6	TS	Nov 15, 2018		Water	S18-No20423												X		
7	TB	Nov 15, 2018		Water	S18-No20424												X		
8	SV18 (FRONT)	Nov 15, 2018		Air	S18-No20425					X									X
9	SV18 (BACK)	Nov 15, 2018		Air	S18-No20426					X									X

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

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Sample Detail						Chloride	Ethane*	Ethylene*	Ferrous Iron - Fe2+	Isopropanol	Methane	Nitrate (as N)	pH (at 25°C)	Sulphate (as SO4)	Total Alkalinity (as CaCO3)	Total Organic Carbon	BTEX	Volatile Organics	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																			
Brisbane Laboratory - NATA Site # 20794																			
Perth Laboratory - NATA Site # 23736																			
10	SV19 (FRONT)	Nov 15, 2018		Air	S18-No20427					X									X
11	SV19 (BACK)	Nov 15, 2018		Air	S18-No20428					X									X
12	QA-V (FRONT)	Nov 15, 2018		Air	S18-No20429					X									X
13	QA-V (BACK)	Nov 15, 2018		Air	S18-No20430					X									X
14	MB (FRONT)	Nov 15, 2018		Air	S18-No20431					X									X
15	MB (BACK)	Nov 15, 2018		Air	S18-No20432					X									X
Test Counts						4	4	4	4	8	4	4	4	4	4	4	2	5	8

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **627998-A**
Project name PENRITH
Project ID 55073
Received Date Nov 15, 2018

Client Sample ID			**SV18 (FRONT)**	**SV18 (BACK)**	**SV19 (FRONT)**	**SV19 (BACK)**
Sample Matrix			**Air**	**Air**	**Air**	**Air**
Eurofins | mgt Sample No.			**S18-No20425**	**S18-No20426**	**S18-No20427**	**S18-No20428**
Date Sampled			**Nov 15, 2018**	**Nov 15, 2018**	**Nov 15, 2018**	**Nov 15, 2018**
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	2.0	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	1.6	< 0.5	2.0	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV18 (FRONT)	SV18 (BACK)	SV19 (FRONT)	SV19 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			S18-No20425	S18-No20426	S18-No20427	S18-No20428
Date Sampled			Nov 15, 2018	Nov 15, 2018	Nov 15, 2018	Nov 15, 2018
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	950	< 0.5	5700	< 0.5
Toluene	0.5	Total ug	0.6	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	8.3	< 0.5	53	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total	1.5	Total ug	1.8	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	78	117	104	110
4-Bromofluorobenzene (surr.)	1	%	77	114	82	106
Dibromofluoromethane (surr.)	1	%	95	109	108	106
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			QA-V (FRONT)	QA-V (BACK)	MB (FRONT)	MB (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins | mgt Sample No.			S18-No20429	S18-No20430	S18-No20431	S18-No20432
Date Sampled			Nov 15, 2018	Nov 15, 2018	Nov 15, 2018	Nov 15, 2018
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			QA-V (FRONT)	QA-V (BACK)	MB (FRONT)	MB (BACK)
Sample Matrix			**Air**	**Air**	**Air**	**Air**
Eurofins | mgt Sample No.			**S18-No20429**	**S18-No20430**	**S18-No20431**	**S18-No20432**
Date Sampled			**Nov 15, 2018**	**Nov 15, 2018**	**Nov 15, 2018**	**Nov 15, 2018**
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	1.7	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	2200	< 0.5	< 0.5	< 0.5
Toluene	0.5	Total ug	1.0	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	9.7	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total	1.5	Total ug	2.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	94	94	94	96
4-Bromofluorobenzene (surr.)	1	%	87	88	91	93
Dibromofluoromethane (surr.)	1	%	104	93	93	99
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Isopropanol	Melbourne	Nov 15, 2018	14 Days
- Method:			
VOCs in Ambient Air by GC/MS	Melbourne	Nov 15, 2018	14 Day
- Method: LTM-ORG-2030 VOCs in Ambient Air by GC/MS			

ABN– 50 005 085 521
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NATA # 1261 Site # 18217

Brisbane
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NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 55073

Order No.:
Report #: 627998
Phone: 02 8245 0300
Fax:

Received: Nov 15, 2018 6:15 PM
Due: Nov 22, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Chloride	Ethane*	Ethylene*	Ferrous Iron - Fe2+	Isopropanol	Methane	Nitrate (as N)	pH (at 25°C)	Sulphate (as SO4)	Total Alkalinity (as CaCO3)	Total Organic Carbon	BTEX	Volatile Organics	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																			
Brisbane Laboratory - NATA Site # 20794																			
Perth Laboratory - NATA Site # 23736																			
External Laboratory																			
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**														
1	JBMW02	Nov 15, 2018		Water	S18-No20418	X	X	X	X		X	X	X	X	X	X		X	
2	JBMW05	Nov 15, 2018		Water	S18-No20419	X	X	X	X		X	X	X	X	X	X		X	
3	PSM01	Nov 15, 2018		Water	S18-No20420	X	X	X	X		X	X	X	X	X	X		X	
4	QA151118	Nov 15, 2018		Water	S18-No20421	X	X	X	X		X	X	X	X	X	X		X	
5	RIN151118	Nov 15, 2018		Water	S18-No20422													X	
6	TS	Nov 15, 2018		Water	S18-No20423												X		
7	TB	Nov 15, 2018		Water	S18-No20424												X		
8	SV18 (FRONT)	Nov 15, 2018		Air	S18-No20425					X									X
9	SV18 (BACK)	Nov 15, 2018		Air	S18-No20426					X									X

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Sample Detail						Chloride	Ethane*	Ethylene*	Ferrous Iron - Fe2+	Isopropanol	Methane	Nitrate (as N)	pH (at 25°C)	Sulphate (as SO4)	Total Alkalinity (as CaCO3)	Total Organic Carbon	BTEX	Volatile Organics	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																			
Brisbane Laboratory - NATA Site # 20794																			
Perth Laboratory - NATA Site # 23736																			
10	SV19 (FRONT)	Nov 15, 2018		Air	S18-No20427					X									X
11	SV19 (BACK)	Nov 15, 2018		Air	S18-No20428					X									X
12	QA-V (FRONT)	Nov 15, 2018		Air	S18-No20429					X									X
13	QA-V (BACK)	Nov 15, 2018		Air	S18-No20430					X									X
14	MB (FRONT)	Nov 15, 2018		Air	S18-No20431					X									X
15	MB (BACK)	Nov 15, 2018		Air	S18-No20432					X									X
Test Counts						4	4	4	4	8	4	4	4	4	4	4	2	5	8

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Isopropanol	Total ug	< 10			10	Pass	
Method Blank							
VOCs in Ambient Air by GC/MS							
1.1-Dichloroethane	Total ug	< 0.5			0.5	Pass	
1.1-Dichloroethene	Total ug	< 0.5			0.5	Pass	
1.1-Dichloropropene	Total ug	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	Total ug	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	Total ug	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	Total ug	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	Total ug	< 0.5			0.5	Pass	
1.2-Dibromo-3-chloropropane	Total ug	< 0.5			0.5	Pass	
1.2-Dibromoethane	Total ug	< 0.5			0.5	Pass	
1.2-Dichloroethane	Total ug	< 0.5			0.5	Pass	
1.2-Dichloropropane	Total ug	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	Total ug	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	Total ug	< 0.5			0.5	Pass	
1.3-Dichloropropane	Total ug	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	Total ug	< 0.5			0.5	Pass	
2-Chlorotoluene	Total ug	< 0.5			0.5	Pass	
2.2-Dichloropropane	Total ug	< 0.5			0.5	Pass	
4-Chlorotoluene	Total ug	< 0.5			0.5	Pass	
Benzene	Total ug	< 0.5			0.5	Pass	
Bromochloromethane	Total ug	< 0.5			0.5	Pass	
Bromodichloromethane	Total ug	< 0.5			0.5	Pass	
Bromoform	Total ug	< 0.5			0.5	Pass	
Carbon Tetrachloride	Total ug	< 0.5			0.5	Pass	
Chlorobenzene	Total ug	< 0.5			0.5	Pass	
Chloroform	Total ug	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	Total ug	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	Total ug	< 0.5			0.5	Pass	
Dibromochloromethane	Total ug	< 0.5			0.5	Pass	
Dibromomethane	Total ug	< 0.5			0.5	Pass	
Ethylbenzene	Total ug	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	Total ug	< 0.5			0.5	Pass	
n-Butylbenzene	Total ug	< 0.5			0.5	Pass	
n-Propylbenzene	Total ug	< 0.5			0.5	Pass	
Naphthalene	Total ug	< 0.5			0.5	Pass	
p-Isopropyltoluene	Total ug	< 0.5			0.5	Pass	
sec-Butylbenzene	Total ug	< 0.5			0.5	Pass	
Styrene	Total ug	< 5			5	Pass	
tert-Butylbenzene	Total ug	< 0.5			0.5	Pass	
Tetrachloroethene	Total ug	< 0.5			0.5	Pass	
Toluene	Total ug	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	Total ug	< 0.5			0.5	Pass	
Trichloroethene	Total ug	< 0.5			0.5	Pass	
Trichlorofluoromethane	Total ug	< 0.5			0.5	Pass	
Vinyl chloride	Total ug	< 0.5			0.5	Pass	
Xylenes - Total	Total ug	< 1.5			1.5	Pass	
1.2-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.2.3-Trichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.2.4-Trichlorobenzene	Total ug	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.3-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
Hexachlorobutadiene	Total ug	< 0.5			0.5	Pass	
LCS - % Recovery							
VOCs in Ambient Air by GC/MS							
1.1-Dichloroethene	%	75			70-130	Pass	
1.1-Dichloropropene	%	90			70-130	Pass	
1.1.1-Trichloroethane	%	83			70-130	Pass	
1.2-Dibromo-3-chloropropane	%	91			75-125	Pass	
1.2-Dichloroethane	%	87			70-130	Pass	
Benzene	%	92			70-130	Pass	
Ethylbenzene	%	96			70-130	Pass	
Naphthalene	%	77			70-130	Pass	
Toluene	%	88			70-130	Pass	
Trichloroethene	%	90			70-130	Pass	
Xylenes - Total	%	93			70-130	Pass	
1.2-Dichlorobenzene	%	92			70-130	Pass	
1.2.3-Trichlorobenzene	%	82			70-130	Pass	
1.2.4-Trichlorobenzene	%	93			70-130	Pass	
1.4-Dichlorobenzene	%	91			70-130	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Nibha Vaidya	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **627998-W**
Project name PENRITH
Project ID 55073
Received Date Nov 15, 2018

Client Sample ID			**JBMW02**	**JBMW05**	**PSM01**	**QA151118**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S18-No20418**	**S18-No20419**	**S18-No20420**	**S18-No20421**
Date Sampled			**Nov 15, 2018**	**Nov 15, 2018**	**Nov 15, 2018**	**Nov 15, 2018**
Test/Reference	LOR	Unit				
Dissolved Gases						
Ethane*	0.1	mg/L	0.1	0.1	< 0.1	< 0.1
Ethylene*	0.1	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Methane	0.05	mg/L	0.09	< 0.05	0.73	0.74
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Butanone (MEK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
2-Propanone (Acetone)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromodichloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromoform	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Bromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Chloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001

Client Sample ID			JBMW02	JBMW05	PSM01	QA151118
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			S18-No20418	S18-No20419	S18-No20420	S18-No20421
Date Sampled			Nov 15, 2018	Nov 15, 2018	Nov 15, 2018	Nov 15, 2018
Test/Reference	LOR	Unit				
Volatile Organics						
Chloroform	0.005	mg/L	< 0.005	< 0.005	< 0.005	< 0.005
Chloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
cis-1.2-Dichloroethene	0.001	mg/L	0.002	< 0.001	< 0.001	< 0.001
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Dichlorodifluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Iodomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	< 0.002
Methylene Chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Styrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Tetrachloroethene	0.001	mg/L	0.073	0.12	0.060	0.063
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Trichloroethene	0.001	mg/L	0.002	0.002	0.001	0.001
Trichlorofluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Total MAH*	0.003	mg/L	< 0.003	< 0.003	< 0.003	< 0.003
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	0.077	0.122	0.061	0.064
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	0.077	0.122	0.061	0.064
4-Bromofluorobenzene (surr.)	1	%	112	116	99	113
Toluene-d8 (surr.)	1	%	107	108	93	108
Chloride	1	mg/L	2600	2900	2000	2000
Ferrous Iron - Fe2+	0.05	mg/L	1.9	0.11	< 0.05	< 0.05
Nitrate (as N)	0.02	mg/L	1.2	< 0.02	1.0	1.1
pH (at 25°C)	0.1	pH Units	8.2	7.8	8.0	7.7
Sulphate (as SO4)	5	mg/L	140	280	59	60
Total Organic Carbon	5	mg/L	20	28	27	19
Alkalinity (speciated)						
Total Alkalinity (as CaCO3)	20	mg/L	600	620	440	430

Client Sample ID			RIN151118	R20TS	TB
Sample Matrix			Water	Water	Water
Eurofins | mgt Sample No.			S18-No20422	S18-No20423	S18-No20424
Date Sampled			Nov 15, 2018	Nov 15, 2018	Nov 15, 2018
Test/Reference	LOR	Unit			
BTEX					
Benzene	0.001	mg/L	-	80	< 0.001
Toluene	0.001	mg/L	-	90	< 0.001
Ethylbenzene	0.001	mg/L	-	94	< 0.001
m&p-Xylenes	0.002	mg/L	-	90	< 0.002
o-Xylene	0.001	mg/L	-	93	< 0.001

Client Sample ID			RIN151118	R20TS	TB
Sample Matrix			Water	Water	Water
Eurofins | mgt Sample No.			S18-No20422	S18-No20423	S18-No20424
Date Sampled			Nov 15, 2018	Nov 15, 2018	Nov 15, 2018
Test/Reference	LOR	Unit			
BTEX					
Xylenes - Total	0.003	mg/L	-	91	< 0.003
4-Bromofluorobenzene (surr.)	1	%	-	90	95
Volatile Organics					
1.1-Dichloroethane	0.001	mg/L	< 0.001	-	-
1.1-Dichloroethene	0.001	mg/L	< 0.001	-	-
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	-	-
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	-	-
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	-	-
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	-	-
1.2-Dibromoethane	0.001	mg/L	< 0.001	-	-
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	-	-
1.2-Dichloroethane	0.001	mg/L	< 0.001	-	-
1.2-Dichloropropane	0.001	mg/L	< 0.001	-	-
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	-	-
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	-	-
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	-	-
1.3-Dichloropropane	0.001	mg/L	< 0.001	-	-
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	-	-
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	-	-
2-Butanone (MEK)	0.001	mg/L	< 0.001	-	-
2-Propanone (Acetone)	0.001	mg/L	< 0.001	-	-
4-Chlorotoluene	0.001	mg/L	< 0.001	-	-
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	-	-
Allyl chloride	0.001	mg/L	< 0.001	-	-
Benzene	0.001	mg/L	< 0.001	-	-
Bromobenzene	0.001	mg/L	< 0.001	-	-
Bromochloromethane	0.001	mg/L	< 0.001	-	-
Bromodichloromethane	0.001	mg/L	< 0.001	-	-
Bromoform	0.001	mg/L	< 0.001	-	-
Bromomethane	0.001	mg/L	< 0.001	-	-
Carbon disulfide	0.001	mg/L	< 0.001	-	-
Carbon Tetrachloride	0.001	mg/L	< 0.001	-	-
Chlorobenzene	0.001	mg/L	< 0.001	-	-
Chloroethane	0.001	mg/L	< 0.001	-	-
Chloroform	0.005	mg/L	< 0.005	-	-
Chloromethane	0.001	mg/L	< 0.001	-	-
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001	-	-
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	-	-
Dibromochloromethane	0.001	mg/L	< 0.001	-	-
Dibromomethane	0.001	mg/L	< 0.001	-	-
Dichlorodifluoromethane	0.001	mg/L	< 0.001	-	-
Ethylbenzene	0.001	mg/L	< 0.001	-	-
Iodomethane	0.001	mg/L	< 0.001	-	-
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	-	-
m&p-Xylenes	0.002	mg/L	< 0.002	-	-
Methylene Chloride	0.001	mg/L	< 0.001	-	-
o-Xylene	0.001	mg/L	< 0.001	-	-
Styrene	0.001	mg/L	< 0.001	-	-
Tetrachloroethene	0.001	mg/L	< 0.001	-	-

Client Sample ID			RIN151118	R20TS	TB
Sample Matrix			**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S18-No20422**	**S18-No20423**	**S18-No20424**
Date Sampled			**Nov 15, 2018**	**Nov 15, 2018**	**Nov 15, 2018**
Test/Reference	LOR	Unit			
Volatile Organics					
Toluene	0.001	mg/L	< 0.001	-	-
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	-	-
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	-	-
Trichloroethene	0.001	mg/L	< 0.001	-	-
Trichlorofluoromethane	0.001	mg/L	< 0.001	-	-
Vinyl chloride	0.001	mg/L	< 0.001	-	-
Xylenes - Total	0.003	mg/L	< 0.003	-	-
Total MAH*	0.003	mg/L	< 0.003	-	-
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	< 0.005	-	-
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.005	-	-
4-Bromofluorobenzene (surr.)	1	%	109	-	-
Toluene-d8 (surr.)	1	%	94	-	-

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
BTEX	Melbourne	Nov 19, 2018	14 Day
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Dissolved Gases	Melbourne	Nov 19, 2018	7 Day
- Method: LTM-ORG-2070 by Headspace GC-FID			
Volatile Organics	Melbourne	Nov 19, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Chloride	Melbourne	Nov 19, 2018	28 Day
- Method: LTM-INO-4090 Chloride by Discrete Analyser			
Ferrous Iron - Fe2+	Melbourne	Nov 23, 2018	7 Days
- Method: LTM-INO-4190 Ferrous Iron in Water by Discrete Analyser			
Nitrate (as N)	Melbourne	Nov 19, 2018	28 Day
- Method: APHA 4500-NO3 Nitrate Nitrogen by FIA			
pH (at 25°C)	Melbourne	Nov 20, 2018	0 Hours
- Method: LTM-GEN-7090 pH in water by ISE			
Sulphate (as SO4)	Melbourne	Nov 19, 2018	28 Day
- Method: LTM-INO-4110 Sulfate by Discrete Analyser			
Total Organic Carbon	Melbourne	Nov 19, 2018	28 Day
- Method: APHA 5310B Total Organic Carbon			
Alkalinity (speciated)	Melbourne	Nov 20, 2018	14 Day
- Method: APHA 2320 Alkalinity by Titration			

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH
Project ID: 55073

Order No.:
Report #: 627998
Phone: 02 8245 0300
Fax:

Received: Nov 15, 2018 6:15 PM
Due: Nov 22, 2018
Priority: 5 Day
Contact Name: Rohan Hammond

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						Chloride	Ethane*	Ethylene*	Ferrous Iron - Fe2+	Isopropanol	Methane	Nitrate (as N)	pH (at 25°C)	Sulphate (as SO4)	Total Alkalinity (as CaCO3)	Total Organic Carbon	BTEX	Volatile Organics	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																			
Brisbane Laboratory - NATA Site # 20794																			
Perth Laboratory - NATA Site # 23736																			
External Laboratory																			
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**														
1	JBMW02	Nov 15, 2018		Water	S18-No20418	X	X	X	X		X	X	X	X	X	X		X	
2	JBMW05	Nov 15, 2018		Water	S18-No20419	X	X	X	X		X	X	X	X	X	X		X	
3	PSM01	Nov 15, 2018		Water	S18-No20420	X	X	X	X		X	X	X	X	X	X		X	
4	QA151118	Nov 15, 2018		Water	S18-No20421	X	X	X	X		X	X	X	X	X	X		X	
5	RIN151118	Nov 15, 2018		Water	S18-No20422													X	
6	TS	Nov 15, 2018		Water	S18-No20423												X		
7	TB	Nov 15, 2018		Water	S18-No20424												X		
8	SV18 (FRONT)	Nov 15, 2018		Air	S18-No20425					X									X
9	SV18 (BACK)	Nov 15, 2018		Air	S18-No20426					X									X

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Sample Detail						Chloride	Ethane*	Ethylene*	Ferrous Iron - Fe2+	Isopropanol	Methane	Nitrate (as N)	pH (at 25°C)	Sulphate (as SO4)	Total Alkalinity (as CaCO3)	Total Organic Carbon	BTEX	Volatile Organics	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X	X	X	X	X	X	X	X	X	X	X	X	X
Sydney Laboratory - NATA Site # 18217																			
Brisbane Laboratory - NATA Site # 20794																			
Perth Laboratory - NATA Site # 23736																			
10	SV19 (FRONT)	Nov 15, 2018		Air	S18-No20427					X									X
11	SV19 (BACK)	Nov 15, 2018		Air	S18-No20428					X									X
12	QA-V (FRONT)	Nov 15, 2018		Air	S18-No20429					X									X
13	QA-V (BACK)	Nov 15, 2018		Air	S18-No20430					X									X
14	MB (FRONT)	Nov 15, 2018		Air	S18-No20431					X									X
15	MB (BACK)	Nov 15, 2018		Air	S18-No20432					X									X
Test Counts						4	4	4	4	8	4	4	4	4	4	4	2	5	8

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Dissolved Gases							
Ethane*	mg/L	< 0.1			0.1	Pass	
Ethylene*	mg/L	< 0.1			0.1	Pass	
Methane	mg/L	< 0.05			0.05	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Benzene	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Chloride	mg/L	< 1			1	Pass	
Ferrous Iron - Fe2+	mg/L	< 0.05			0.05	Pass	
Nitrate (as N)	mg/L	< 0.02			0.02	Pass	
Sulphate (as SO4)	mg/L	< 5			5	Pass	
Total Organic Carbon	mg/L	< 5			5	Pass	
Method Blank							
Alkalinity (speciated)							
Total Alkalinity (as CaCO3)	mg/L	< 20			20	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	101			70-130	Pass	
Toluene	%	88			70-130	Pass	
Ethylbenzene	%	92			70-130	Pass	
m&p-Xylenes	%	88			70-130	Pass	
Xylenes - Total	%	89			70-130	Pass	
LCS - % Recovery							
Dissolved Gases							
Ethane*	%	107			70-130	Pass	
Ethylene*	%	109			70-130	Pass	
Methane	%	109			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	81			70-130	Pass	
1.1.1-Trichloroethane	%	91			70-130	Pass	
1.2-Dichlorobenzene	%	89			70-130	Pass	
1.2-Dichloroethane	%	106			70-130	Pass	
Benzene	%	101			70-130	Pass	
Ethylbenzene	%	92			70-130	Pass	
m&p-Xylenes	%	88			70-130	Pass	
Toluene	%	88			70-130	Pass	
Trichloroethene	%	89			70-130	Pass	
Xylenes - Total	%	89			70-130	Pass	
LCS - % Recovery							
Chloride	%	118			70-130	Pass	
Ferrous Iron - Fe2+	%	121			70-130	Pass	
Nitrate (as N)	%	99			70-130	Pass	
Sulphate (as SO4)	%	108			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Total Organic Carbon			%	103			70-130	Pass	
LCS - % Recovery									
Alkalinity (speciated)									
Total Alkalinity (as CaCO3)			%	98			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Dissolved Gases				Result 1					
Methane	S18-No20280	NCP	%	111			70-130	Pass	
Spike - % Recovery									
				Result 1					
Nitrate (as N)	S18-No20280	NCP	%	96			70-130	Pass	
Spike - % Recovery									
Alkalinity (speciated)				Result 1					
Total Alkalinity (as CaCO3)	B18-No23810	NCP	%	95			70-130	Pass	
Spike - % Recovery									
				Result 1					
Ferrous Iron - Fe2+	M18-No25179	NCP	%	92			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	M18-No21976	NCP	%	82			70-130	Pass	
Toluene	M18-No21976	NCP	%	86			70-130	Pass	
Ethylbenzene	M18-No21976	NCP	%	90			70-130	Pass	
m&p-Xylenes	M18-No21976	NCP	%	89			70-130	Pass	
o-Xylene	M18-No21976	NCP	%	88			70-130	Pass	
Xylenes - Total	M18-No21976	NCP	%	89			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
				Result 1	Result 2	RPD			
Chloride	B18-No18872	NCP	mg/L	1700	1700	1.0	30%	Pass	
Nitrate (as N)	S18-No20280	NCP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
pH (at 25°C)	M18-No22697	NCP	pH Units	7.9	7.9	pass	30%	Pass	
Sulphate (as SO4)	S18-No20275	NCP	mg/L	56	57	1.1	30%	Pass	
Total Organic Carbon	S18-No20418	CP	mg/L	20	18	6.0	30%	Pass	
Duplicate									
Alkalinity (speciated)				Result 1	Result 2	RPD			
Total Alkalinity (as CaCO3)	M18-No25228	NCP	mg/L	510	520	2.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
Ferrous Iron - Fe2+	S18-No20419	CP	mg/L	0.11	0.11	5.0	30%	Pass	
Duplicate									
Dissolved Gases				Result 1	Result 2	RPD			
Ethane*	S18-No20420	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Ethylene*	S18-No20420	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
Methane	S18-No20420	CP	mg/L	0.73	0.73	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	M18-No21975	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	M18-No21975	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	M18-No21975	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	M18-No21975	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	M18-No21975	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total	M18-No21975	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Nibha Vaidya	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Julie Kay	Senior Analyst-Inorganic (VIC)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins | mgt shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins | mgt be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

016623

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 55073	LABORATORY BATCH NO.:
PROJECT NAME: Penrith	SAMPLERS: CB
DATE NEEDED BY: standard turn around time	QC LEVEL: NEPM (2013)

PHONE: Sydney: 02 8245 0300 | Perth: 08 9488 0100 | Brisbane: 07 3112 2688

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) rhammond@jbsg.com.au; (3) cbennett@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	VOCs	BTEX	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
JBMW06	water	21/11		4x vials		X				
JBMW07	↓	↓		↓		X				
RIN211118				2x V 1x M 1x A		X				
TS				2x V			X			
TB	↓	↓		2x V			X			

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: CB DATE: 21/11/18	CONSIGNMENT NOTE NO.	NAME: Luca D. 21/11/18	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 5:48 PM	COOLER TEMP ..... deg C 10.1°C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

IMSO FormsO13 – Chain of Custody - Generic

628902

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Enviro Sample NSW

From: Rohan Hammond <RHammond@jbsg.com.au>
Sent: Wednesday, 21 November 2018 10:10 PM
To: Enviro Sample NSW; Nibha Vaidya
Subject: 55073 water samples

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Nibha,

Just confirming the water samples received today for 55073 are on 24 hr tat.

I forgot to double check the COC.

Rohan

Sent from my Samsung Galaxy smartphone.

Click here to report this email as spam.

ScannedByWebsenseForEurofins

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Melbourne
3-5 Kingston Town Close
Oakleigh Vic 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261 Site # 23736

ABN – 50 005 085 521 e.mail : EnviroSales@eurofins.com web : www.eurofins.com.au

Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Rohan Hammond
Project name: PENRITH
Project ID: 55073
COC number: Not provided
Turn around time: 1 Day
Date/Time received: Nov 21, 2018 5:48 PM
Eurofins | mgt reference: **628902**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins | mgt Sample Receipt : 10.1 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Nibha Vaidya on Phone : +61 (2) 9900 8415 or by e.mail: NibhaVaidya@eurofins.com

Results will be delivered electronically via e.mail to Rohan Hammond - rhammond@jbsg.com.au.

Note: A copy of these results will also be delivered to the general JBS & G Australia (NSW) P/L email address.

ABN– 50 005 085 521
e.mail : EnviroSales@eurofins.com
web : www.eurofins.com.au

Melbourne
2-5 Kingston Town Close
Oakleigh VIC 3166
Phone : +61 3 8564 5000
NATA # 1261
Site # 1254 & 14271

Sydney
Unit F3, Building F
16 Mars Road
Lane Cove West NSW 2066
Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	JBS & G Australia (NSW) P/L	**Order No.:**		**Received:**	Nov 21, 2018 5:48 PM
Address:	Level 1, 50 Margaret St Sydney NSW 2000	**Report #:**	628902	**Due:**	Nov 22, 2018
		Phone:	02 8245 0300	**Priority:**	1 Day
		Fax:		**Contact Name:**	Rohan Hammond
Project Name:	PENRITH				
Project ID:	55073				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						BTEX	Volatile Organics
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	JBMW06	Nov 21, 2018		Water	S18-No27821		X
2	JBMW07	Nov 21, 2018		Water	S18-No27822		X
3	RIN211118	Nov 21, 2018		Water	S18-No27823		X
4	TS	Nov 21, 2018		Water	S18-No27824	X	
5	TB	Nov 21, 2018		Water	S18-No27825	X	
Test Counts						2	3

Certificate of Analysis

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Rohan Hammond**

Report **628902-W**
Project name PENRITH
Project ID 55073
Received Date Nov 21, 2018

Client Sample ID			**JBMW06**	**JBMW07**	**RIN211118**	**TS**
Sample Matrix			**Water**	**Water**	**Water**	**Water**
Eurofins | mgt Sample No.			**S18-No27821**	**S18-No27822**	**S18-No27823**	**S18-No27824**
Date Sampled			**Nov 21, 2018**	**Nov 21, 2018**	**Nov 21, 2018**	**Nov 21, 2018**
Test/Reference	LOR	Unit				
BTEX						
Comments						R20
Benzene	0.001	mg/L	-	-	-	110
Toluene	0.001	mg/L	-	-	-	100
Ethylbenzene	0.001	mg/L	-	-	-	110
m&p-Xylenes	0.002	mg/L	-	-	-	100
o-Xylene	0.001	mg/L	-	-	-	100
Xylenes - Total	0.003	mg/L	-	-	-	100
4-Bromofluorobenzene (surr.)	1	%	-	-	-	114
Volatile Organics						
1.1-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.1-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.1.1-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.1.1.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.1.2-Trichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.1.2.2-Tetrachloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2-Dibromoethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2-Dichloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2.3-Trichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.2.4-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.3-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.3-Dichloropropane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.3.5-Trimethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
1.4-Dichlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
2-Butanone (MEK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
2-Propanone (Acetone)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
4-Chlorotoluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
4-Methyl-2-pentanone (MIBK)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Allyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Benzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Bromobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Bromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Bromodichloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Bromoform	0.001	mg/L	< 0.001	< 0.001	< 0.001	-

Client Sample ID			JBMW06	JBMW07	RIN211118	TS
Sample Matrix			Water	Water	Water	Water
Eurofins | mgt Sample No.			S18-No27821	S18-No27822	S18-No27823	S18-No27824
Date Sampled			Nov 21, 2018	Nov 21, 2018	Nov 21, 2018	Nov 21, 2018
Test/Reference	LOR	Unit				
Volatile Organics						
Bromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Carbon disulfide	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Carbon Tetrachloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Chlorobenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Chloroethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Chloroform	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Chloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
cis-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
cis-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Dibromochloromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Dibromomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Dichlorodifluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Ethylbenzene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Iodomethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Isopropyl benzene (Cumene)	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
m&p-Xylenes	0.002	mg/L	< 0.002	< 0.002	< 0.002	-
Methylene Chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
o-Xylene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Styrene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Tetrachloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Toluene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
trans-1.2-Dichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
trans-1.3-Dichloropropene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Trichloroethene	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Trichlorofluoromethane	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Vinyl chloride	0.001	mg/L	< 0.001	< 0.001	< 0.001	-
Xylenes - Total	0.003	mg/L	< 0.003	< 0.003	< 0.003	-
Total MAH*	0.003	mg/L	< 0.003	< 0.003	< 0.003	-
Vic EPA IWRG 621 CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.005	< 0.005	< 0.005	-
4-Bromofluorobenzene (surr.)	1	%	112	92	102	-
Toluene-d8 (surr.)	1	%	105	87	98	-

Client Sample ID			TB
Sample Matrix			Water
Eurofins | mgt Sample No.			S18-No27825
Date Sampled			Nov 21, 2018
Test/Reference	LOR	Unit	
BTEX			
Benzene	0.001	mg/L	< 0.001
Toluene	0.001	mg/L	< 0.001
Ethylbenzene	0.001	mg/L	< 0.001
m&p-Xylenes	0.002	mg/L	< 0.002
o-Xylene	0.001	mg/L	< 0.001
Xylenes - Total	0.003	mg/L	< 0.003
4-Bromofluorobenzene (surr.)	1	%	129

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results (regarding both quality and NATA accreditation).

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
BTEX	Melbourne	Nov 22, 2018	14 Day
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Volatile Organics	Melbourne	Nov 22, 2018	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			

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Site # 1254 & 14271

Sydney
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Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
2/91 Leach Highway
Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

Company Name:	JBS & G Australia (NSW) P/L	**Order No.:**		**Received:**	Nov 21, 2018 5:48 PM
Address:	Level 1, 50 Margaret St Sydney NSW 2000	**Report #:**	628902	**Due:**	Nov 22, 2018
		Phone:	02 8245 0300	**Priority:**	1 Day
		Fax:		**Contact Name:**	Rohan Hammond
Project Name:	PENRITH				
Project ID:	55073				

Eurofins | mgt Analytical Services Manager : Nibha Vaidya

Sample Detail						BTEX	Volatile Organics
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	JBMW06	Nov 21, 2018		Water	S18-No27821		X
2	JBMW07	Nov 21, 2018		Water	S18-No27822		X
3	RIN211118	Nov 21, 2018		Water	S18-No27823		X
4	TS	Nov 21, 2018		Water	S18-No27824	X	
5	TB	Nov 21, 2018		Water	S18-No27825	X	
Test Counts						2	3

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram

mg/L: milligrams per litre

ug/L: micrograms per litre

ppm: Parts per million

ppb: Parts per billion

%: Percentage

org/100mL: Organisms per 100 millilitres

NTU: Nephelometric Turbidity Units

MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	Quality Systems Manual ver 5.1 US Department of Defense
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 50-150%-Phenols & PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.1 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.1-Dichloroethene	mg/L	< 0.001			0.001	Pass	
1.1.1-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2-Trichloroethane	mg/L	< 0.001			0.001	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dibromoethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.2-Dichloroethane	mg/L	< 0.001			0.001	Pass	
1.2-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.3-Trichloropropane	mg/L	< 0.001			0.001	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
1.3-Dichloropropane	mg/L	< 0.001			0.001	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.001			0.001	Pass	
1.4-Dichlorobenzene	mg/L	< 0.001			0.001	Pass	
2-Butanone (MEK)	mg/L	< 0.001			0.001	Pass	
2-Propanone (Acetone)	mg/L	< 0.001			0.001	Pass	
4-Chlorotoluene	mg/L	< 0.001			0.001	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.001			0.001	Pass	
Allyl chloride	mg/L	< 0.001			0.001	Pass	
Benzene	mg/L	< 0.001			0.001	Pass	
Bromobenzene	mg/L	< 0.001			0.001	Pass	
Bromochloromethane	mg/L	< 0.001			0.001	Pass	
Bromodichloromethane	mg/L	< 0.001			0.001	Pass	
Bromoform	mg/L	< 0.001			0.001	Pass	
Bromomethane	mg/L	< 0.001			0.001	Pass	
Carbon disulfide	mg/L	< 0.001			0.001	Pass	
Carbon Tetrachloride	mg/L	< 0.001			0.001	Pass	
Chlorobenzene	mg/L	< 0.001			0.001	Pass	
Chloroethane	mg/L	< 0.001			0.001	Pass	
Chloroform	mg/L	< 0.005			0.005	Pass	
Chloromethane	mg/L	< 0.001			0.001	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Dibromochloromethane	mg/L	< 0.001			0.001	Pass	
Dibromomethane	mg/L	< 0.001			0.001	Pass	
Dichlorodifluoromethane	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
Iodomethane	mg/L	< 0.001			0.001	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Methylene Chloride	mg/L	< 0.001			0.001	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Styrene	mg/L	< 0.001			0.001	Pass	
Tetrachloroethene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.001			0.001	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.001			0.001	Pass	
Trichloroethene	mg/L	< 0.001			0.001	Pass	
Trichlorofluoromethane	mg/L	< 0.001			0.001	Pass	
Vinyl chloride	mg/L	< 0.001			0.001	Pass	
Xylenes - Total	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	100			70-130	Pass	
Toluene	%	97			70-130	Pass	
Ethylbenzene	%	83			70-130	Pass	
m&p-Xylenes	%	81			70-130	Pass	
Xylenes - Total	%	83			70-130	Pass	

Comments

Eurofins | mgt accreditation number 1261, corporate site 1254 is currently in progress of a controlled transition to a new custom built location at 6 Monterey Road, Dandenong South, Victoria 3175. All results on this report denoted as being performed by Eurofins | mgt 2-5 Kingston Town Close, Oakleigh Victoria 3166 corporate site 1254, will have been performed on either Oakleigh or new Dandenong South site.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Nibha Vaidya	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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CERTIFICATE OF ANALYSIS 205736

Client Details

Client	JBS & G (NSW & WA) Pty Ltd
Attention	C Bennett, Rohan Hammond
Address	Level 1, 50 Margaret St, Sydney, NSW, 2000

Sample Details

Your Reference	**55073, Penrith**
Number of Samples	1 Water, 1 Carbon Tube
Date samples received	15/11/2018
Date completed instructions received	15/11/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	22/11/2018
Date of Issue	22/11/2018

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Chris Guo, Senior Chemist, Air
Jeremy Faircloth, Organics Supervisor
Nick Sarlamis, Inorganics Supervisor
Steven Luong, Senior Chemist

Authorised By

Jacinta Hurst, Laboratory Manager

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

VOCs in water		
Our Reference		205736-1
Your Reference	UNITS	QC15118
Date Sampled		15/11/2018
Type of sample		Water
Date extracted	-	20/11/2018
Date analysed	-	21/11/2018
Dichlorodifluoromethane	µg/L	<10
Chloromethane	µg/L	<10
Vinyl Chloride	µg/L	<10
Bromomethane	µg/L	<10
Chloroethane	µg/L	<10
Trichlorofluoromethane	µg/L	<10
1,1-Dichloroethene	µg/L	<1
Trans-1,2-dichloroethene	µg/L	<1
1,1-dichloroethane	µg/L	<1
Cis-1,2-dichloroethene	µg/L	<1
Bromochloromethane	µg/L	<1
Chloroform	µg/L	<1
2,2-dichloropropane	µg/L	<1
1,2-dichloroethane	µg/L	<1
1,1,1-trichloroethane	µg/L	<1
1,1-dichloropropene	µg/L	<1
Cyclohexane	µg/L	<1
Carbon tetrachloride	µg/L	<1
Benzene	µg/L	<1
Dibromomethane	µg/L	<1
1,2-dichloropropane	µg/L	<1
Trichloroethene	µg/L	1
Bromodichloromethane	µg/L	<1
trans-1,3-dichloropropene	µg/L	<1
cis-1,3-dichloropropene	µg/L	<1
1,1,2-trichloroethane	µg/L	<1
Toluene	µg/L	<1
1,3-dichloropropane	µg/L	<1
Dibromochloromethane	µg/L	<1
1,2-dibromoethane	µg/L	<1
Tetrachloroethene	µg/L	53
1,1,1,2-tetrachloroethane	µg/L	<1
Chlorobenzene	µg/L	<1
Ethylbenzene	µg/L	<1
Bromoform	µg/L	<1

VOCs in water		
Our Reference		205736-1
Your Reference	UNITS	QC15118
Date Sampled		15/11/2018
Type of sample		Water
m+p-xylene	µg/L	<2
Styrene	µg/L	<1
1,1,2,2-tetrachloroethane	µg/L	<1
o-xylene	µg/L	<1
1,2,3-trichloropropane	µg/L	<1
Isopropylbenzene	µg/L	<1
Bromobenzene	µg/L	<1
n-propyl benzene	µg/L	<1
2-chlorotoluene	µg/L	<1
4-chlorotoluene	µg/L	<1
1,3,5-trimethyl benzene	µg/L	<1
Tert-butyl benzene	µg/L	<1
1,2,4-trimethyl benzene	µg/L	<1
1,3-dichlorobenzene	µg/L	<1
Sec-butyl benzene	µg/L	<1
1,4-dichlorobenzene	µg/L	<1
4-isopropyl toluene	µg/L	<1
1,2-dichlorobenzene	µg/L	<1
n-butyl benzene	µg/L	<1
1,2-dibromo-3-chloropropane	µg/L	<1
1,2,4-trichlorobenzene	µg/L	<1
Hexachlorobutadiene	µg/L	<1
1,2,3-trichlorobenzene	µg/L	<1
Surrogate Dibromofluoromethane	%	105
Surrogate toluene-d8	%	99
Surrogate 4-BFB	%	98

Miscellaneous Inorganics		
Our Reference		205736-1
Your Reference	UNITS	QC15118
Date Sampled		15/11/2018
Type of sample		Water
Date prepared	-	15/11/2018
Date analysed	-	15/11/2018
Sulphate, SO4	mg/L	63
Nitrate as N in water	mg/L	0.82
Chloride, Cl	mg/L	1,800
Ferrous Iron	mg/L	1.7
pH	pH Units	6.5
Total Organic Carbon	mg/L	2
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	400
Carbonate Alkalinity as $CaCO_3$	mg/L	<5
Total Alkalinity as $CaCO_3$	mg/L	400

Dissolved Gases in Water		
Our Reference		205736-1
Your Reference	UNITS	QC15118
Date Sampled		15/11/2018
Type of sample		Water
Date prepared	-	16/11/2018
Date analysed	-	16/11/2018
Methane	µg/L	780
Ethene	µg/L	<5
Ethane	µg/L	<5

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

VOC in Carbon tubes		
Our Reference		205736-2
Your Reference	UNITS	QC-V
Date Sampled		-
Type of sample		Carbon Tube
Date extracted	-	20/11/2018
Date analysed	-	20/11/2018
Acetone	µg/tube	<5
Acrylonitrile	µg/tube	<5
Methylethylketone (MEK)	µg/tube	<5
Hexane	µg/tube	<5
Ethylacetate	µg/tube	<5
1,2-Dichloroethane	µg/tube	<5
Benzene	µg/tube	<2
Carbon Tetrachloride	µg/tube	<5
Cyclohexane	µg/tube	<5
Ethylacrylate	µg/tube	<5
Trichloroethene	µg/tube	53
1,4-Dioxane	µg/tube	<5
Propylene Oxide	µg/tube	<10
Epichlorohydrin	µg/tube	<5
Methylisobutylketone (MIBK)	µg/tube	<5
Toluene	µg/tube	<5
Tetrachloroethene	µg/tube	7,800
n-Butylacetate	µg/tube	<5
Chlorobenzene	µg/tube	<5
Ethylbenzene	µg/tube	<5
m-Xylene	µg/tube	<5
p-Xylene	µg/tube	<5
Styrene	µg/tube	<5
o-Xylene	µg/tube	<5
Cyclohexanone	µg/tube	<5
Nonane	µg/tube	<5
Isopropylbenzene	µg/tube	<5
Diisobutylketone (DIBK)	µg/tube	<5
a-Methylstyrene	µg/tube	<5
Decane	µg/tube	<5
Benzylchloride	µg/tube	<5
Naphthalene	µg/tube	<5
Dodecane	µg/tube	<5
TVOC's as hexane in tubes*	µg/tube	27,000
Surrogate Toluene-d8	%	101

VOC in Carbon tubes		
Our Reference		205736-2
Your Reference	UNITS	QC-V
Date Sampled		-
Type of sample		Carbon Tube
Surrogate 4-Bromofluorobenzene	%	100

Method ID	Methodology Summary
AT-006	Dissolved gases determined by GC-FID using method USEPA SOP RSK175
AT-008	Determination of volatile organic compounds in charcoal tubes/badges/sorbents using CS2 extraction, based on NIOSH methods. Desorption efficiencies are not applied to results in ug/tube. Note where µg/m^3 results are supplied for SKC badges, the factors used are for 575-001, if 575-001 data is unavailable for an analyte then use 575-002 then 575-003 (exposure time must be supplied).
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-055	Nitrate - determined colourimetrically. Soils are analysed following a water extraction.
Inorg-076	Ferrous Iron is determined colourimetrically by discrete analyser.
Inorg-079	TOC determined using a TOC analyser using the combustion method. Dissolved requires filtering prior to determination. Analysis using APHA latest edition 5310B.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Alternatively determined by colourimetry/turbidity using Discrete Analyer.
Org-013	Water samples are analysed directly by purge and trap GC-MS.

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date extracted	-			20/11/2018	[NT]	[NT]	[NT]	[NT]	20/11/2018	[NT]
Date analysed	-			21/11/2018	[NT]	[NT]	[NT]	[NT]	21/11/2018	[NT]
Dichlorodifluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-013	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
2,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	111	[NT]
1,1,1-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
1,1-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromomethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Bromodichloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	112	[NT]
1,2-dibromoethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromoform	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-013	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Styrene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
o-xylene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
1,2,3-trichloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-013	101	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate toluene-d8	%		Org-013	97	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-BFB	%		Org-013	102	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			15/11/2018	[NT]	[NT]	[NT]	[NT]	15/11/2018	[NT]
Date analysed	-			15/11/2018	[NT]	[NT]	[NT]	[NT]	15/11/2018	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Nitrate as N in water	mg/L	0.005	Inorg-055	<0.005	[NT]	[NT]	[NT]	[NT]	96	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Ferrous Iron	mg/L	0.05	Inorg-076	<0.05	[NT]	[NT]	[NT]	[NT]	94	[NT]
pH	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]
Total Organic Carbon	mg/L	1	Inorg-079	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: Dissolved Gases in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			16/11/2018	1	16/11/2018	16/11/2018		16/11/2018	[NT]
Date analysed	-			16/11/2018	1	16/11/2018	16/11/2018		16/11/2018	[NT]
Methane	µg/L	5	AT-006	<5	1	780	770	1	99	[NT]
Ethene	µg/L	5	AT-006	<5	1	<5	<5	0	97	[NT]
Ethane	µg/L	5	AT-006	<5	1	<5	<5	0	98	[NT]

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

QUALITY CONTROL: VOC in Carbon tubes					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			20/11/2018	[NT]	[NT]	[NT]	[NT]	20/11/2018	[NT]
Date analysed	-			20/11/2018	[NT]	[NT]	[NT]	[NT]	20/11/2018	[NT]
Acetone	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	108	[NT]
Acrylonitrile	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	110	[NT]
Methylethylketone (MEK)	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	117	[NT]
Hexane	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	115	[NT]
Ethylacetate	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	118	[NT]
1,2-Dichloroethane	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	114	[NT]
Benzene	µg/tube	2	AT-008	<2	[NT]	[NT]	[NT]	[NT]	108	[NT]
Carbon Tetrachloride	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	109	[NT]
Cyclohexane	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	107	[NT]
Ethylacrylate	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	106	[NT]
Trichloroethene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	104	[NT]
1,4-Dioxane	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	107	[NT]
Propylene Oxide	µg/tube	10	AT-008	<10	[NT]	[NT]	[NT]	[NT]	106	[NT]
Epichlorohydrin	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	106	[NT]
Methylisobutylketone (MIBK)	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	98	[NT]
Toluene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	94	[NT]
Tetrachloroethene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	89	[NT]
n-Butylacetate	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	91	[NT]
Chlorobenzene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	87	[NT]
Ethylbenzene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	85	[NT]
m-Xylene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	86	[NT]
p-Xylene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	84	[NT]
Styrene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	84	[NT]
o-Xylene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	84	[NT]
Cyclohexanone	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	86	[NT]
Nonane	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	84	[NT]
Isopropylbenzene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	83	[NT]
Diisobutylketone (DIBK)	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	83	[NT]
a-Methylstyrene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	84	[NT]
Decane	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	83	[NT]
Benzylchloride	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	81	[NT]
Naphthalene	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	82	[NT]
Dodecane	µg/tube	5	AT-008	<5	[NT]	[NT]	[NT]	[NT]	81	[NT]
TVOC's as hexane in tubes*	µg/tube	50	AT-008	<50	[NT]	[NT]	[NT]	[NT]	115	[NT]
Surrogate Toluene-d8	%		AT-008	122	[NT]	[NT]	[NT]	[NT]	90	[NT]
Surrogate 4-Bromofluorobenzene	%		AT-008	114	[NT]	[NT]	[NT]	[NT]	80	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Envirolab Services Pty Ltd
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SAMPLE RECEIPT ADVICE

Client Details

Client	JBS & G (NSW & WA) Pty Ltd
Attention	C Bennett, Rohan Hammond

Sample Login Details

Your reference	55073, Penrith
Envirolab Reference	205736
Date Sample Received	15/11/2018
Date Instructions Received	15/11/2018
Date Results Expected to be Reported	22/11/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	1 Water, 1 Carbon Tube
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	1.2
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Sample ID	VOCs in water	Sulphate, SO4	Nitrate as N in water	Chloride, Cl	Ferrous Iron	pH	Total Organic Carbon	Hydroxide Alkalinity (OH-) as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Dissolved Gases in Water	VOC in Carbon tubes
QC15118	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
QC-V													✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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CERTIFICATE OF ANALYSIS 205744

Client Details

Client	JBS & G (NSW & WA) Pty Ltd
Attention	Rohan Hammond
Address	Level 1, 50 Margaret St, Sydney, NSW, 2000

Sample Details

Your Reference	**Penrith**
Number of Samples	4xAir
Date samples received	16/11/2018
Date completed instructions received	16/11/2018

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	23/11/2018
Date of Issue	21/11/2018

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Chris Guo, Senior Chemist, Air

Authorised By

Jacinta Hurst, Laboratory Manager

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

TO15 in Canisters/Bags					
Our Reference		205744-1	205744-2	205744-3	205744-4
Your Reference	UNITS	2/134_SHOP	140_SHOP	QA_AA1	140_SHOP_2
Date Sampled		15/11/2018	15/11/2018	15/11/2018	15/11/2018
Type of sample		Air	Air	Air	Air
Air Kit Security No.		h2879	h2877	h3341	h3623
Vacuum before Shipment	Hg"	-30	-30	-30	-30
Vacuum before Analysis	Hg"	-10	-9	-10	-10
Date prepared	-	20/11/2018	20/11/2018	20/11/2018	20/11/2018
Date analysed	-	20/11/2018	20/11/2018	20/11/2018	20/11/2018
Propylene	ppbv	<0.5	<0.5	<0.5	<0.5
Dichlorodifluoromethane	ppbv	<0.5	<0.5	<0.5	0.5
Chloromethane	ppbv	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorotetrafluoroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	ppbv	<0.5	<0.5	<0.5	<0.5
1,3-Butadiene	ppbv	<0.5	<0.5	<0.5	<0.5
Bromomethane	ppbv	<0.5	<0.5	<0.5	<0.5
Chloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Ethanol	ppbv	180	51	53	77
Acrolein	ppbv	4	<0.5	<0.5	<0.5
Trichlorofluoromethane (Freon 11)	ppbv	<0.5	<0.5	<0.5	<0.5
Acetone	ppbv	10	<5	<5	<5
Isopropyl Alcohol	ppbv	<5	7	7	<5
1,1-Dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5
1,1,2-Trichlorotrifluoroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Methylene chloride (Dichloromethane)	ppbv	<5	<5	<5	<5
Carbon Disulfide	ppbv	<0.5	0.6	0.5	<0.5
trans-1,2-dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5
MTBE	ppbv	<0.5	<0.5	<0.5	<0.5
1,1- Dichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Vinyl Acetate	ppbv	<0.5	<0.5	<0.5	<0.5
MEK	ppbv	<0.5	<0.5	<0.5	<0.5
Hexane	ppbv	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5
Ethyl Acetate	ppbv	7.0	1	1	<0.5
Chloroform	ppbv	0.6	<0.5	<0.5	<0.5
Tetrahydrofuran	ppbv	<0.5	<0.5	<0.5	<0.5
1,1,1-Trichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
1,2-Dichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Benzene	ppbv	<0.5	<0.5	<0.5	<0.5
Carbon tetrachloride	ppbv	<0.5	<0.5	<0.5	<0.5
Cyclohexane	ppbv	<0.5	<0.5	<0.5	<0.5

TO15 in Canisters/Bags					
Our Reference		205744-1	205744-2	205744-3	205744-4
Your Reference	UNITS	2/134_SHOP	140_SHOP	QA_AA1	140_SHOP_2
Date Sampled		15/11/2018	15/11/2018	15/11/2018	15/11/2018
Type of sample		Air	Air	Air	Air
Air Kit Security No.		h2879	h2877	h3341	h3623
Heptane	ppbv	0.6	<0.5	<0.5	<0.5
Trichloroethene	ppbv	<0.5	<0.5	<0.5	<0.5
1,2-Dichloropropane	ppbv	<0.5	<0.5	<0.5	<0.5
1,4-Dioxane	ppbv	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	ppbv	<0.5	<0.5	<0.5	<0.5
Methyl Methacrylate	ppbv	<0.5	<0.5	<0.5	<0.5
MIBK	ppbv	<0.5	<0.5	<0.5	<0.5
cis-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5	<0.5
trans-1,3-Dichloropropene	ppbv	<0.5	<0.5	<0.5	<0.5
Toluene	ppbv	1	0.7	0.7	0.6
1,1,2-Trichloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
Methyl Butyl Ketone	ppbv	<0.5	<0.5	<0.5	<0.5
Dibromochloromethane	ppbv	<0.5	<0.5	<0.5	<0.5
Tetrachloroethene	ppbv	<0.5	<0.5	<0.5	0.7
1,2-Dibromoethane	ppbv	<0.5	<0.5	<0.5	<0.5
Chlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	ppbv	0.8	<0.5	<0.5	<0.5
m-& p-Xylene	ppbv	7	<1	<1	<1
Styrene	ppbv	<0.5	<0.5	<0.5	<0.5
o-Xylene	ppbv	2	<0.5	<0.5	<0.5
Bromoform	ppbv	<0.5	<0.5	<0.5	<0.5
1,1,2,2-Tetrachloroethane	ppbv	<0.5	<0.5	<0.5	<0.5
4-ethyl toluene	ppbv	0.8	<0.5	<0.5	<0.5
1,3,5-Trimethylbenzene	ppbv	2	<0.5	<0.5	<0.5
1,2,4-Trimethylbenzene	ppbv	4	<0.5	<0.5	0.7
1,3-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5
Benzyl chloride	ppbv	<0.5	<0.5	<0.5	<0.5
1,4-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5
1,2-Dichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5
1,2,4-Trichlorobenzene	ppbv	<0.5	<0.5	<0.5	<0.5
Naphthalene	ppbv	<0.5	<0.5	<0.5	<0.5
Hexachloro- 1,3-butadiene	ppbv	<0.5	<0.5	<0.5	<0.5
Surrogate-Bromochloromethane	% rec	99	118	102	98
Surrogate -1,4-Difluorobenzene	% rec	91	105	91	92
Surrogate-Chlorobenzene-D5	% rec	89	102	88	87

TO15 in Canisters ug/m3					
Our Reference		205744-1	205744-2	205744-3	205744-4
Your Reference	UNITS	2/134_SHOP	140_SHOP	QA_AA1	140_SHOP_2
Date Sampled		15/11/2018	15/11/2018	15/11/2018	15/11/2018
Type of sample		Air	Air	Air	Air
Air Kit Security No.		h2879	h2877	h3341	h3623
Vacuum before Shipment	Hg"	-30	-30	-30	-30
Vacuum before Analysis	Hg"	-10	-9	-10	-10
Date prepared	-	20/11/2018	20/11/2018	20/11/2018	20/11/2018
Date analysed	-	20/11/2018	20/11/2018	20/11/2018	20/11/2018
Propylene	µg/m³	<0.9	<0.9	<0.9	<0.9
Dichlorodifluoromethane	µg/m³	<2.5	<2.5	<2.5	3
Chloromethane	µg/m³	<1	<1	<1	<1
1,2-Dichlorotetrafluoroethane	µg/m³	<2.5	<2.5	<2.5	<2.5
Vinyl chloride	µg/m³	<1.3	<1.3	<1.3	<1.3
1,3-Butadiene	µg/m³	<1.1	<1.1	<1.1	<1.1
Bromomethane	µg/m³	<1.9	<1.9	<1.9	<1.9
Chloroethane	µg/m³	<1.3	<1.3	<1.3	<1.3
Ethanol	µg/m³	350	97	100	140
Acrolein	µg/m³	8	<1.1	<1.1	<1.1
Trichlorofluoromethane (Freon 11)	µg/m³	<2.8	<2.8	<2.8	<2.8
Acetone	µg/m³	30	<12	<12	<12
Isopropyl Alcohol	µg/m³	<12	20	20	<12
1,1-Dichloroethene	µg/m³	<2	<2	<2	<2
1,1,2-Trichlorotrifluoroethane	µg/m³	<3.8	<3.8	<3.8	<3.8
Methylene chloride (Dichloromethane)	µg/m³	<17	<17	<17	<17
Carbon Disulfide	µg/m³	<1.6	2	2	<1.6
trans-1,2-dichloroethene	µg/m³	<2	<2	<2	<2
MTBE	µg/m³	<1.8	<1.8	<1.8	<1.8
1,1- Dichloroethane	µg/m³	<2	<2	<2	<2
Vinyl Acetate	µg/m³	<1.8	<1.8	<1.8	<1.8
MEK	µg/m³	<1.5	<1.5	<1.5	<1.5
Hexane	µg/m³	<1.8	<1.8	<1.8	<1.8
cis-1,2-Dichloroethene	µg/m³	<2	<2	<2	<2
Ethyl Acetate	µg/m³	25	5	5	<1.8
Chloroform	µg/m³	3	<2.4	<2.4	<2.4
Tetrahydrofuran	µg/m³	<1.5	<1.5	<1.5	<1.5
1,1,1-Trichloroethane	µg/m³	<2.7	<2.7	<2.7	<2.7
1,2-Dichloroethane	µg/m³	<2	<2	<2	<2
Benzene	µg/m³	<1.6	<1.6	<1.6	<1.6
Carbon tetrachloride	µg/m³	<3.1	<3.1	<3.1	<3.1
Cyclohexane	µg/m³	<1.7	<1.7	<1.7	<1.7

TO15 in Canisters ug/m3					
Our Reference		205744-1	205744-2	205744-3	205744-4
Your Reference	UNITS	2/134_SHOP	140_SHOP	QA_AA1	140_SHOP_2
Date Sampled		15/11/2018	15/11/2018	15/11/2018	15/11/2018
Type of sample		Air	Air	Air	Air
Air Kit Security No.		h2879	h2877	h3341	h3623
Heptane	µg/m³	2	<2	<2	<2
Trichloroethene	µg/m³	<2.7	<2.7	<2.7	<2.7
1,2-Dichloropropane	µg/m³	<2.3	<2.3	<2.3	<2.3
1,4-Dioxane	µg/m³	<1.8	<1.8	<1.8	<1.8
Bromodichloromethane	µg/m³	<3.4	<3.4	<3.4	<3.4
Methyl Methacrylate	µg/m³	<2	<2	<2	<2
MIBK	µg/m³	<2	<2	<2	<2
cis-1,3-Dichloropropene	µg/m³	<2.3	<2.3	<2.3	<2.3
trans-1,3-Dichloropropene	µg/m³	<2.3	<2.3	<2.3	<2.3
Toluene	µg/m³	4	2	2	2
1,1,2-Trichloroethane	µg/m³	<2.7	<2.7	<2.7	<2.7
Methyl Butyl Ketone	µg/m³	<2	<2	<2	<2
Dibromochloromethane	µg/m³	<1.6	<1.6	<1.6	<1.6
Tetrachloroethene	µg/m³	<3.4	<3.4	<3.4	5
1,2-Dibromoethane	µg/m³	<3.8	<3.8	<3.8	<3.8
Chlorobenzene	µg/m³	<2.3	<2.3	<2.3	<2.3
Ethylbenzene	µg/m³	3	<2.2	<2.2	<2.2
m-& p-Xylene	µg/m³	30	<4.3	<4.3	<4.3
Styrene	µg/m³	<2.1	<2.1	<2.1	<2.1
o-Xylene	µg/m³	10	<2.2	<2.2	<2.2
Bromoform	µg/m³	<5.2	<5.2	<5.2	<5.2
1,1,2,2-Tetrachloroethane	µg/m³	<3.4	<3.4	<3.4	<3.4
4-ethyl toluene	µg/m³	4	<2.5	<2.5	<2.5
1,3,5-Trimethylbenzene	µg/m³	10	<2.5	<2.5	<2.5
1,2,4-Trimethylbenzene	µg/m³	20	<2.5	<2.5	4
1,3-Dichlorobenzene	µg/m³	<3	<3	<3	<3
Benzyl chloride	µg/m³	<2.6	<2.6	<2.6	<2.6
1,4-Dichlorobenzene	µg/m³	<3	<3	<3	<3
1,2-Dichlorobenzene	µg/m³	<3	<3	<3	<3
1,2,4-Trichlorobenzene	µg/m³	<3.7	<3.7	<3.7	<3.7
Naphthalene	µg/m³	<2.6	<2.6	<2.6	<2.6
Hexachloro- 1,3-butadiene	µg/m³	<5.3	<5.3	<5.3	<5.3
Surrogate-Bromochloromethane	% rec	99	118	102	98
Surrogate -1,4-Difluorobenzene	% rec	91	105	91	92
Surrogate-Chlorobenzene-D5	% rec	89	102	88	87

Method ID	Methodology Summary
TO15	USEPA TO15 - Analysis of VOC's in air following USEPA TO15 protocols
USEPA 18	Measurement of Gaseous Organic Compound Emissions by Gas Chromatography using USEPA m18.

QUALITY CONTROL: TO15 in Canisters/Bags					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Vacuum before Shipment	Hg"			[NT]	1	-30	-30	0	[NT]	[NT]
Vacuum before Analysis	Hg"			[NT]	1	-10	-10	0	[NT]	[NT]
Date prepared	-			20/11/2018	1	20/11/2018	20/11/2018		20/11/2018	[NT]
Date analysed	-			20/11/2018	1	20/11/2018	20/11/2018		20/11/2018	[NT]
Propylene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	111	[NT]
Dichlorodifluoromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichlorotetrafluoroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Vinyl chloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,3-Butadiene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Bromomethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethanol	ppbv	5	TO15	<5	1	180	180	0	[NT]	[NT]
Acrolein	ppbv	0.5	TO15	<0.5	1	4	4	0	[NT]	[NT]
Trichlorofluoromethane (Freon 11)	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Acetone	ppbv	5	TO15	<5	1	10	10	0	[NT]	[NT]
Isopropyl Alcohol	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	[NT]
1,1-Dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,2-Trichlorotrifluoroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methylene chloride (Dichloromethane)	ppbv	5	TO15	<5	1	<5	<5	0	[NT]	[NT]
Carbon Disulfide	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
trans-1,2-dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MTBE	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1- Dichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Vinyl Acetate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MEK	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Hexane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	103	[NT]
cis-1,2-Dichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethyl Acetate	ppbv	0.5	TO15	<0.5	1	7.0	5.8	19	[NT]	[NT]
Chloroform	ppbv	0.5	TO15	<0.5	1	0.6	0.6	0	[NT]	[NT]
Tetrahydrofuran	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,1-Trichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Benzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	107	[NT]
Carbon tetrachloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Cyclohexane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	97	[NT]
Heptane	ppbv	0.5	TO15	<0.5	1	0.6	0.6	0	106	[NT]
Trichloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]

QUALITY CONTROL: TO15 in Canisters/Bags						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
1,2-Dichloropropane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,4-Dioxane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Bromodichloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methyl Methacrylate	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
MIBK	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
cis-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
trans-1,3-Dichloropropene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Toluene	ppbv	0.5	TO15	<0.5	1	1	1	0	105	[NT]
1,1,2-Trichloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Methyl Butyl Ketone	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Dibromochloromethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Tetrachloroethene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dibromoethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Chlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	ppbv	0.5	TO15	<0.5	1	0.8	0.8	0	110	[NT]
m-& p-Xylene	ppbv	1	TO15	<1	1	7	7	0	107	[NT]
Styrene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	103	[NT]
o-Xylene	ppbv	0.5	TO15	<0.5	1	2	2	0	110	[NT]
Bromoform	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,1,2,2-Tetrachloroethane	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
4-ethyl toluene	ppbv	0.5	TO15	<0.5	1	0.8	0.9	12	104	[NT]
1,3,5-Trimethylbenzene	ppbv	0.5	TO15	<0.5	1	2	2	0	107	[NT]
1,2,4-Trimethylbenzene	ppbv	0.5	TO15	<0.5	1	4	4	0	109	[NT]
1,3-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Benzyl chloride	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,4-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2-Dichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
1,2,4-Trichlorobenzene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Naphthalene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Hexachloro- 1,3-butadiene	ppbv	0.5	TO15	<0.5	1	<0.5	<0.5	0	[NT]	[NT]
Surrogate-Bromochloromethane	% rec		TO15	104	1	99	81	20	106	[NT]
Surrogate -1,4-Difluorobenzene	% rec		TO15	98	1	91	113	22	98	[NT]
Surrogate-Chlorobenzene-D5	% rec		TO15	95	1	89	112	23	97	[NT]

QUALITY CONTROL: TO15 in Canisters ug/m3						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Vacuum before Shipment	Hg"			[NT]	1	-30	-30	0	[NT]	[NT]
Vacuum before Analysis	Hg"			[NT]	1	-10	-10	0	[NT]	[NT]
Date prepared	-			20/11/2018	1	20/11/2018	20/11/2018		[NT]	[NT]
Date analysed	-			20/11/2018	1	20/11/2018	20/11/2018		[NT]	[NT]
Propylene	µg/m³	0.9	TO15	<0.9	1	<0.9	<0.9	0	[NT]	[NT]
Dichlorodifluoromethane	µg/m³	2.5	TO15	<2.5	1	<2.5	<2.5	0	[NT]	[NT]
Chloromethane	µg/m³	1.0	TO15	<1.0	1	<1	<1	0	[NT]	[NT]
1,2-Dichlorotetrafluoroethane	µg/m³	2.5	TO15	<2.5	1	<2.5	<2.5	0	[NT]	[NT]
Vinyl chloride	µg/m³	1.3	TO15	<1.3	1	<1.3	<1.3	0	[NT]	[NT]
1,3-Butadiene	µg/m³	1.1	TO15	<1.1	1	<1.1	<1.1	0	[NT]	[NT]
Bromomethane	µg/m³	1.9	TO15	<1.9	1	<1.9	<1.9	0	[NT]	[NT]
Chloroethane	µg/m³	1.3	TO15	<1.3	1	<1.3	<1.3	0	[NT]	[NT]
Ethanol	µg/m³	9	TO15	<9	1	350	340	3	[NT]	[NT]
Acrolein	µg/m³	1.1	TO15	<1.1	1	8	8	0	[NT]	[NT]
Trichlorofluoromethane (Freon 11)	µg/m³	2.8	TO15	<2.8	1	<2.8	<2.8	0	[NT]	[NT]
Acetone	µg/m³	11.9	TO15	<11.9	1	30	30	0	[NT]	[NT]
Isopropyl Alcohol	µg/m³	12	TO15	<12	1	<12	<12	0	[NT]	[NT]
1,1-Dichloroethene	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
1,1,2-Trichlorotrifluoroethane	µg/m³	3.8	TO15	<3.8	1	<3.8	<3.8	0	[NT]	[NT]
Methylene chloride (Dichloromethane)	µg/m³	20	USEPA 18	<20	1	<17	<17	0	[NT]	[NT]
Carbon Disulfide	µg/m³	1.6	TO15	<1.6	1	<1.6	<1.6	0	[NT]	[NT]
trans-1,2-dichloroethene	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
MTBE	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
1,1- Dichloroethane	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
Vinyl Acetate	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
MEK	µg/m³	1.5	TO15	<1.5	1	<1.5	<1.5	0	[NT]	[NT]
Hexane	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
cis-1,2-Dichloroethene	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
Ethyl Acetate	µg/m³	1.8	TO15	<1.8	1	25	21	17	[NT]	[NT]
Chloroform	µg/m³	2.4	TO15	<2.4	1	3	3	0	[NT]	[NT]
Tetrahydrofuran	µg/m³	1.5	TO15	<1.5	1	<1.5	<1.5	0	[NT]	[NT]
1,1,1-Trichloroethane	µg/m³	2.7	TO15	<2.7	1	<2.7	<2.7	0	[NT]	[NT]
1,2-Dichloroethane	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
Benzene	µg/m³	1.6	TO15	<1.6	1	<1.6	<1.6	0	[NT]	[NT]
Carbon tetrachloride	µg/m³	3.1	TO15	<3.1	1	<3.1	<3.1	0	[NT]	[NT]
Cyclohexane	µg/m³	1.7	TO15	<1.7	1	<1.7	<1.7	0	[NT]	[NT]
Heptane	µg/m³	2.0	TO15	<2.0	1	2	2	0	[NT]	[NT]
Trichloroethene	µg/m³	2.7	TO15	<2.7	1	<2.7	<2.7	0	[NT]	[NT]

QUALITY CONTROL: TO15 in Canisters ug/m3						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
1,2-Dichloropropane	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0	[NT]	[NT]
1,4-Dioxane	µg/m³	1.8	TO15	<1.8	1	<1.8	<1.8	0	[NT]	[NT]
Bromodichloromethane	µg/m³	3.4	TO15	<3.4	1	<3.4	<3.4	0	[NT]	[NT]
Methyl Methacrylate	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
MIBK	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
cis-1,3-Dichloropropene	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0	[NT]	[NT]
trans-1,3-Dichloropropene	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0	[NT]	[NT]
Toluene	µg/m³	1.9	TO15	<1.9	1	4	4	0	[NT]	[NT]
1,1,2-Trichloroethane	µg/m³	2.7	TO15	<2.7	1	<2.7	<2.7	0	[NT]	[NT]
Methyl Butyl Ketone	µg/m³	2.0	TO15	<2.0	1	<2	<2	0	[NT]	[NT]
Dibromochloromethane	µg/m³	1.6	TO15	<1.6	1	<1.6	<1.6	0	[NT]	[NT]
Tetrachloroethene	µg/m³	3.4	TO15	<3.4	1	<3.4	<3.4	0	[NT]	[NT]
1,2-Dibromoethane	µg/m³	3.8	TO15	<3.8	1	<3.8	<3.8	0	[NT]	[NT]
Chlorobenzene	µg/m³	2.3	TO15	<2.3	1	<2.3	<2.3	0	[NT]	[NT]
Ethylbenzene	µg/m³	2.2	TO15	<2.2	1	3	4	29	[NT]	[NT]
m-& p-Xylene	µg/m³	4.3	TO15	<4.3	1	30	30	0	[NT]	[NT]
Styrene	µg/m³	2.1	TO15	<2.1	1	<2.1	<2.1	0	[NT]	[NT]
o-Xylene	µg/m³	2.2	TO15	<2.2	1	10	10	0	[NT]	[NT]
Bromoform	µg/m³	5.2	TO15	<5.2	1	<5.2	<5.2	0	[NT]	[NT]
1,1,2,2-Tetrachloroethane	µg/m³	3.4	TO15	<3.4	1	<3.4	<3.4	0	[NT]	[NT]
4-ethyl toluene	µg/m³	2.5	TO15	<2.5	1	4	4	0	[NT]	[NT]
1,3,5-Trimethylbenzene	µg/m³	2.5	TO15	<2.5	1	10	10	0	[NT]	[NT]
1,2,4-Trimethylbenzene	µg/m³	2.5	TO15	<2.5	1	20	20	0	[NT]	[NT]
1,3-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	1	<3	<3	0	[NT]	[NT]
Benzyl chloride	µg/m³	2.6	TO15	<2.6	1	<2.6	<2.6	0	[NT]	[NT]
1,4-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	1	<3	<3	0	[NT]	[NT]
1,2-Dichlorobenzene	µg/m³	3.0	TO15	<3.0	1	<3	<3	0	[NT]	[NT]
1,2,4-Trichlorobenzene	µg/m³	3.7	TO15	<3.7	1	<3.7	<3.7	0	[NT]	[NT]
Naphthalene	µg/m³	2.6	TO15	<2.6	1	<2.6	<2.6	0	[NT]	[NT]
Hexachloro- 1,3-butadiene	µg/m³	5.3	TO15	<5.3	1	<5.3	<5.3	0	[NT]	[NT]
Surrogate-Bromochloromethane	% rec		TO15	104	1	99	81	20	[NT]	[NT]
Surrogate -1,4-Difluorobenzene	% rec		TO15	98	1	91	113	22	[NT]	[NT]
Surrogate-Chlorobenzene-D5	% rec		TO15	95	1	89	112	23	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

55073

ENVIROLAB

CANISTER CHAIN OF CUSTODY RECORD

Page 1 of 1

3BS 4G

Client Name	[redacted]	Project Contact	Rohan Hammond	Quote No	
Client Address	[redacted] 1/50 Margaret St, Sydney	Contact Phone No		Date Results Required	1 day / 2 days / 3 days / Standard
		Contact Mobile No	0430 379 445		
Project Name	Penrith	Results Required by	Std TAT	E-mail Report To	rhammond@jsbog.com.au cbennett@jsbog.com.au
Site Location	Penrith	Sampled by	CB	PO No	55073

Client sample ID (Field location)	Canister #	Soil gas train / Mass flow controller #	Leak Test Passed	PID Reading (ppmv)	Date of Collection	Collection Time		Canister vacuum (Hg")		Analysis requested							
						Time on	Time off	Initial	Final	TO-15	TPH	5-Sulfides	Ozone precursors	RGA gases			
safe 1/134_SHOP	H2879	1973			15.11.18	6:30	2:05	30	3	X							
140_SHOP	H2877	1975			↓	8:40	4:45	30	10	X							
QA_AA1	H3341	1974				8:40	4:47	29	7	X							
1 passage 140_SHOP_2	H3623	1964			↓	8:45	4:49	30	9	X							

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 205744

Date Received: 16/11/18

Time Received: 10:00 AM

Received By: HL

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Intact/Broken/None

Relinquished by	CB	Date & Time	15.11.18	Received by	Lab	Date & Time	16/11/18	Notes:
Print Name	Claudia Bennett	Signature		Print Name	Hnoko	Signature		

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix I Detailed Quality Assurance / Quality Control Data

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

ESDAT QA Checker
Project:52372
Filter: ALL

Overview Summary
- Count of Samples
- Summary By Compound
- Count of Results

Holding Times
- Holding Time Errors (101)

Blanks
- Field Blanks
- Detects in Lab Blanks (0)
- SDG's without Method Blanks (0)

Duplicates
- Field and Interlab Duplicates
- Lab Duplicates with high RPDs (0)
- Duplicate Samples with incorrect or missing Parent Samples (0)
- Samples at the same Location/Depth/Time not specified as duplicates (0)

Surrogates
- Surrogate Variation > 30% or outside lab LCL or UCL (9)

Lab Control Samples
- SDG's without a Laboratory Control Sample (0)
- Laboratory Control Samples, Error > 30% (0)

Certified and Standard Reference Materials
- Certified Reference Materials - Error > 30% (0)

Matrix Spikes
- SDG's without a Matrix Spike (0)
- Trip Spikes with invalid Control Sample (0)
- Less than 1 matrix spike in 20 samples, or less than 1 matrix duplicate in 20 samples (3)
- Matrix Spike Recoveries less than 70% or greater than 130% or outside lab LCL or UCL (1)
- Trip Spike Recoveries (70% - 130% is acceptable) (12)

Inorganic
- Na + CL > TDS (0)
- BOD > COD (0)
- BOD > COD (0)

Other
- Unit Conversion Problems (0)
- OriginalChemNames Requiring Validation (0)
- Samples with no Results (0)
- Samples associated with Wells which are not specified in the Well Table (0)
- Aborted Analysis (0)

Contents

Count of Samples

Matrix Type	GAS	SOIL	WATER
First Sample Date	9/04/2018	9/04/2018	9/04/2018
Last Sample Date	17/04/2018	10/04/2018	16/04/2018
Sampling Period (days)	9	2	8
Number of Samples Submitted	25	14	17
Number of Non QA Samples Submitted	23	10	8
Number of Field Blanks	0	0	0
Number of Trip Blanks	0	0	2
Number of Rinsates	0	0	3
Number of Field Duplicates	2	2	2
Number of Trip Spikes	0	0	2
Number of Lab Duplicates	2	4	1
Number of LCSs	4	12	14
Number of CRMs	0	0	0
Number of Method Blanks	6	11	12
Number of Storage Blanks	0	0	0
Number of Matrix Spikes	0	12	10
Number of Matrix Spike Dupes	0	0	0

Filter: ALL

			Num Results	Holding Times (days)			Lab Control Samples			Method and Storage Blanks			Laboratory Duplicates			Surrogates			Matrix,Trip and Compound Spikes			Field,Rinsate and Trip Blanks			Field Duplicates		
Method_Type	ChemName	Range	Non QA (Normal + Composite)	Volatility Group	Sample to Extraction	Sample to Analysis	Acceptable	Recovery %	Num Reported	Acceptable	Range	Num Reported	Acceptable	Max RPD > EQL x 1	Num Reported	Acceptable	Recovery %	Num Reported	Acceptable	Recovery %	Num Reported	Acceptable	Range	Num Reported	Acceptable	Max RPD > EQL x 1	Num Reported	Acceptable
Organic	>C10-C16 Fraction		0	SVOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	C6-C10 Fraction		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	Isopropyl alcohol		14	VOC	3	10	Y	105 to 105	1	Y	ND	1	Y		0	N		0			0			0			2	Y
SVOC	1,2,3-trichlorobenzene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	1,2,4-trichlorobenzene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	1,2-Dichlorobenzene		0	VOC			Y	95 to 95	1	Y	ND	1	Y		0	N		0			0			0			0	N
	1,3-dichlorobenzene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	1,4-dichlorobenzene		0	VOC			Y	77 to 77	1	Y	ND	1	Y		0	N		0			0			0			0	N
	Hexachlorobutadiene		0	VOC			Y		0		ND	2	Y		0	N		0			0			0			0	N
TO15 in Canisters + ug/m3 calc	1,1,1-trichloroethane		9	VOC	2 to 5	2 to 5	Y		0		ND	2	Y		2	Y		0			0			0			0	N
	1,1,2,2-tetrachloroethane		9	VOC	2 to 5	2 to 5	Y		0		ND	2	Y		2	Y		0			0			0			0	N
	1,1,2-trichloroethane		9	VOC	2 to 5	2 to 5	Y		0		ND	2	Y		2	Y		0			0			0			0	N
	1,1,2-trichlorotrifluoroethane		9	SVOC	2 to 5	2 to 5	Y		0		ND	3	Y		2	Y		0			0			0			0	N
	1,1-dichloroethane		9	VOC	2 to 5	2 to 5	Y		0		ND	2	Y		2	Y		0			0			0			0	N
	1,1-dichloroethene		9	VOC	2 to 5	2 to 5	Y		0		ND	2	Y		2	Y		0			0			0			0	N
	1,2,4-trichlorobenzene		9	VOC	2 to 5	2 to 5	Y		0		ND	2	Y		2	Y		0			0			0			0	N
	1,2,4-trimethyl benzene		9	VOC	2 to 5	2 to 5	Y	101 to 101	2	Y		0			2	Y		0			0			0			0	N
	1,2-dibromoethane		9	VOC	2 to 5	2 to 5	Y		0			0			2	Y		0			0			0			0	N
	1,2-Dichlorobenzene		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	1,2-dichloroethane		9	VOC	2 to 5	2 to 5	Y		0			0			2	Y		0			0			0			0	N
	1,2-dichloropropane		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	1,2-dichlorotetrafluoroethane		9	SVOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	1,3,5-trimethyl benzene		9	VOC	2 to 5	2 to 5	Y	102 to 102	2	Y	ND	1	Y		2	Y		0			0			0			0	N
	1,3-Butadiene		9	SVOC	2 to 5	2 to 5	Y		0			0			2	Y		0			0			0			0	N
	1,3-dichlorobenzene		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	1,4-dichlorobenzene		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	1,4-Dioxane		9	SVOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	2-Butanone (MEK)		9	VOC	2 to 5	2 to 5	Y		0			0			2	Y		0			0			0			0	N
	2-Hexanone (MBK)		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	2-Propanone (Acetone)		9	Other	2 to 5	2 to 5	Y		0		ND	1	Y	0	2	Y		0			0			0			0	N
	4-ethyl toluene		9	SVOC	2 to 5	2 to 5	Y	98 to 98	2	Y	ND	1	Y		2	Y		0			0			0			0	N
	4-Methyl-2-pentanone (MIBK)		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	Acrolein		9	SVOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	Benzene		9	VOC	2 to 5	2 to 5	Y	110 to 110	2	Y		0		0	2	Y		0			0			0			0	N
	Benzyl chloride		9	SVOC	2 to 5	2 to 5	Y		0			0			2	Y		0			0			0			0	N
	Bromochloromethane		0	Other			Y	104 to 104	2	Y		0			0	N	99 to 107	15	Y		0			0			0	N
	Bromodichloromethane		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	Bromomethane		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	Carbon disulfide		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	Carbon tetrachloride		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	Chlorobenzene		9	Other	2 to 5	2 to 5	Y	111 to 111	2	Y	ND	1	Y		2	Y	99.5 to 111	15	Y		0			0			0	N
	Chloroethane		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	Chloroform		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y	0	2	Y		0			0			0			0	N
	Chloromethane		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	cis-1,2-dichloroethene		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	cis-1,3-dichloropropene		9	VOC	2 to 5	2 to 5	Y		0			0			2	Y		0			0			0			0	N
	Cyclohexane		9	VOC	2 to 5	2 to 5	Y	98 to 98	2	Y	ND	1	Y		2	Y		0			0			0			0	N
	Dibromochloromethane		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	Dichlorodifluoromethane		9	VOC	2 to 5	2 to 5	Y		0			0		0	2	Y		0			0			0			0	N
	Dichloromethane		9	SVOC	2 to 5	2 to 5	Y		0			0			2	Y		0			0			0			0	N
	Ethanol		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y	4	2	Y		0			0			0			0	N
	Ethyl Acetate		9	SVOC	2 to 5	2 to 5	Y		0		ND	1	Y	0	2	Y		0			0			0			0	N
	Ethylbenzene		9	VOC	2 to 5	2 to 5	Y	104 to 104	2	Y	ND	1	Y		2	Y		0			0			0			0	N
	Heptane		9	SVOC	2 to 5	2 to 5	Y	104 to 104	2	Y	ND	1	Y		2	Y		0			0			0			0	N
	Hexachlorobutadiene		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	Hexane		9	SVOC	2 to 5	2 to 5	Y	104 to 104	2	Y	ND	1	Y	29	2	Y		0			0			0			0	N
	Isopropyl alcohol		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y	2	2	Y		0			0			0			0	N
	Methyl Methacrylate		9	SVOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	MTBE		9	SVOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	Naphthalene		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	Propylene		9	SVOC	2 to 5	2 to 5	Y	113 to 113	2	Y	ND	1	Y	0	2	Y		0			0			0			0	N
	Styrene		9	VOC	2 to 5	2 to 5	Y	100 to 100	2	Y	ND	1	Y		2	Y		0			0			0			0	N
	Surrogate-1,4-Difluorobenzene		0	SVOC			Y	104 to 104	2	Y	ND	1	Y		0	N	98 to 104	15	Y		0			0			0	N
	Tetrachloroethene		9	SVOC	2 to 5	2 to 5	Y		0		ND	1	Y	0	2	Y		0			0			0			0	N
	Tetrahydrofuran		9	SVOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	Toluene		9	VOC	2 to 5	2 to 5	Y	106 to 106	2	Y	ND	1	Y	22	2	Y		0			0			0			0	N
	trans-1,2-dichloroethene		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	trans-1,3-dichloropropene		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	Tribromomethane		9	VOC	2 to 5	2 to 5	Y		0		ND	1	Y		2	Y		0			0			0			0	N
	Trichloroethene		9	VOC	2 to 5	2 to 5	Y		0			0			2	Y		0			0			0			0	N
	Trichlorofluoromethane		9	VOC	2 to 5	2 to 5	Y		0			0			2	Y		0			0			0			0	N
	Vinyl Acetate		9	VOC	2 to 5	2 to 5	Y		0			0			2	Y		0			0			0			0	N
	Vinyl Chloride		9	VOC	2 to 5	2 to 5	Y		0			0			2	Y		0			0			0			0	N
	Xylene (m & p)		9	VOC	2 to 5	2 to 5	Y	106 to 106	2	Y	ND	1	Y		2	Y		0			0			0			0	N
	Xylene (o)		9	VOC	2 to 5	2 to 5	Y	106 to 106	2	Y		0			2	Y		0			0			0			0	N
VOC	1,1,1,2-tetrachloroethane		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	1,1,1-trichloroethane		0	VOC			Y	95 to 95	1	Y	ND	1	Y		0	N		0			0			0			0	N
	1,1,2,2-tetrachloroethane		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	1,1,2-trichloroethane		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	1,1-dichloroethane		0	VOC			Y		0			0			0	N		0			0			0			0	N
	1,1-dichloroethene		0	VOC			Y	105 to 105	1	Y	ND	1	Y		0	N		0			0			0			0	N
	1,1-dichloropropene		0	VOC			Y	96 to 96	1	Y	ND	1	Y		0	N		0			0			0			0	N
	1,2,3-trichloropropane		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	1,2,4-trimethyl benzene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	1,2-dibromo-3-chloropropane		0	VOC			Y	84 to 84	1	Y	ND	1	Y		0	N		0			0			0			0	N
	1,2-dibromoethane		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	1,2-dichloroethane		0	VOC			Y	95 to 95	1	Y	ND	1	Y		0	N		0			0			0			0	N
	1,2-dichloropropane		0	VOC			Y		0			0			0	N		0			0			0			0	N
	1,3,5-trimethyl benzene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	1,3-dichloropropane		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	2,2-dichloropropane		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	2-chlorotoluene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	4-chlorotoluene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	4-isopropyl toluene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N

Filter: ALL

	Bromochloromethane		0	Other			Y		0		ND	1	Y		0	N		0			0			0			0	N
	Bromodichloromethane		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	Carbon tetrachloride		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	Chlorobenzene		0	Other			Y		0		ND	1	Y		0	N		0			0			0			0	N
	Chloroform		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	cis-1,2-dichloroethene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	cis-1,3-dichloropropene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	Dibromochloromethane		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	Dibromomethane		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	Ethylbenzene		0	VOC			Y	88 to 88	1	Y	ND	1	Y		0	N		0			0			0			0	N
	Isopropylbenzene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	Naphthalene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	n-butyl benzene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	n-propyl benzene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	sec-butyl benzene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	Styrene		0	VOC			Y		0			0			0	N		0			0			0			0	N
	Tert-butyl benzene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	Tetrachloroethene		0	SVOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	Toluene		0	VOC			Y	88 to 88	1	Y	ND	1	Y		0	N		0			0			0			0	N
	trans-1,3-dichloropropene		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	Tribromomethane		0	VOC			Y		0			0			0	N		0			0			0			0	N
	Trichloroethene		0	VOC			Y	92 to 92	1	Y	ND	1	Y		0	N		0			0			0			0	N
	Trichlorofluoromethane		0	VOC			Y		0			0			0	N		0			0			0			0	N
	Vinyl Chloride		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	Xylene (Total)		0	VOC			Y	86 to 86	1	Y	ND	1	Y		0	N		0			0			0			0	N
Volatile	1,1,1,2-tetrachloroethane		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	1,1,1-trichloroethane		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	1,1,2,2-tetrachloroethane		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	1,1,2-trichloroethane		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	1,1-dichloroethane		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	1,1-dichloroethene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	1,1-dichloropropene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	1,2,3-trichlorobenzene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	1,2,3-trichloropropane		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	1,2,4-trichlorobenzene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	1,2,4-trimethyl benzene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	1,2-dibromo-3-chloropropane		14	VOC	3	10	Y		0			0			0	N		0			0			0			2	Y
	1,2-dibromoethane		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	1,2-Dichlorobenzene		14	VOC	3	10	Y		0			0			0	N		0			0			0			2	Y
	1,2-dichloroethane		14	VOC	3	10	Y		0			0			0	N		0			0			0			2	Y
	1,2-dichloropropane		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	1,3,5-trimethyl benzene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	1,3-dichlorobenzene		14	VOC	3	10	Y		0			0			0	N		0			0			0			2	Y
	1,3-dichloropropane		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	1,4-dichlorobenzene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	2,2-dichloropropane		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	2-chlorotoluene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	4-chlorotoluene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	4-isopropyl toluene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Benzene		14	VOC	3	10	Y	91 to 91	1	Y	ND	1	Y		0	N		0			0			0			2	Y
	Bromochloromethane		14	Other	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Bromodichloromethane		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Carbon tetrachloride		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Chlorobenzene		14	Other	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Chloroform		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	cis-1,2-dichloroethene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	cis-1,3-dichloropropene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Dibromochloromethane		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Dibromomethane		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Ethylbenzene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Fluorobenzene (surr.)		0	SVOC			Y		0		ND	1	Y		0	N	81 to 115	18	Y		0			0			0	N
	Hexachlorobutadiene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Isopropylbenzene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Naphthalene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	n-butyl benzene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	n-propyl benzene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	sec-butyl benzene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Styrene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Surrogate 4-BFB		0	VOC			Y		0		ND	1	Y		0	N	61 to 91	18	N		0			0			0	N
	Surrogate Dibromofluoromethane		0	VOC			Y		0		ND	1	Y		0	N	89 to 128	18	Y		0			0			0	N
	Tert-butyl benzene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Tetrachloroethene		14	SVOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Toluene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	trans-1,3-dichloropropene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Tribromomethane		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Trichloroethene		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Trichlorofluoromethane		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Vinyl Chloride		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
	Xylene (Total)		14	VOC	3	10	Y		0		ND	1	Y		0	N		0			0			0			2	Y
8 metals in soil	Arsenic (Total)		0	Other	3	3	Y	108 to 108	1	Y	ND	1	Y	15	1	Y		0			0			0			0	N
	Cadmium		0	Other	3	3	Y	100 to 100	1	Y	ND	1	Y	2	1	Y		0			0			0			0	N
	Chromium (Total)		0	Other	3	3	Y	107 to 107	1	Y	ND	1	Y	13	1	Y		0			0			0			0	N
	Copper		0	Other	3	3	Y	110 to 110	1	Y	ND	1	Y	2	1	Y		0			0			0			0	N
	Lead		0	Other	3	3	Y	106 to 106	1	Y	ND	1	Y	0	1	Y		0			0			0			0	N
	Mercury (Inorganic)		0	Other	3	3	Y	92 to 92	1	Y	ND	1	Y	40	1	Y		0			0			0			0	N
	Nickel		0	Other	3	3	Y	103 to 103	1	Y	ND	1	Y	8	1	Y		0			0			0			0	N
	Zinc		0	Other	3	3	Y	104 to 104	1	Y	ND	1	Y	12	1	Y		0			0			0			0	N
Heavy Metal	Arsenic (Total)	2 mg/kg	2	Other	3 to 16	14	Y	107 to 107	1	Y	ND	1	Y		0	N		0		91 to 101	2	Y		0			0	N
	Cadmium	0.4 mg/kg	2	Other	3 to 16	14	Y	103 to 103	1	Y	ND	1	Y		0	N		0		92 to 97	2	Y		0			0	N
	Chromium (Total)	5 mg/kg	2	Other	3 to 16	14	Y	110 to 110	1	Y	ND	1	Y		0	N		0		90 to 105	2	Y		0			0	N
	Copper	5 mg/kg	2	Other	3 to 16	14	Y	103 to 103	1	Y	ND	1	Y		0	N		0		91 to 102	2	Y		0			0	N
	Lead	5 mg/kg	3	Other	3 to 16	14 to 15	Y	106 to 118	2	Y	ND	1	Y		0	N		0		93 to 120	3	Y		0			0	N
	Mercury (Inorganic)	0.1 mg/kg	2	Other	3 to 16	14	Y	86 to 86	1	Y	ND	1	Y		0	N		0		86 to 91	2	Y		0			0	N
	Nickel	5 mg/kg	2	Other	3 to 16	14	Y	103 to 103	1	Y	ND	1	Y		0	N		0		90 to 98	2	Y		0			0	N
	Zinc	5 mg/kg	2	Other	3 to 16	14	Y	107 to 107	1	Y	ND	1	Y		0	N		0		95 to 132	2	N		0			0	N
Inorganic	% Moisture 103oC	1 %	7	Other	2 to 16	14 to 15	Y		0		ND	1	Y	6	1	Y		0			0			0			30	1	Y
Moisture	Moisture		0	Other	3 to 4	6 to 7	Y		0		ND	1	Y		0	N		0			0			0			0	N
Organic	>C10-C16 Fraction	50 mg/kg	7	SVOC	3 to 16	14 to 15	N	79 to 79	1	Y	ND	1	Y		0	N		0		85 to 109	2	Y		0			1	Y
	>C10-C16 less Naphthalene (F2)	50 mg/kg	7	SVOC	2 to 16	14 to 15	N		0		ND	1	Y		0	N		0			0			0			1	Y

Filter: ALL

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

	>C16-C34 Fraction	100 mg/kg	7	SVOC	3 to 16	14 to 15	N		0			0			0	N		0			0			0			1	Y
	>C34-C40 Fraction	100 mg/kg	7	SVOC	3 to 16	14 to 15	N		0			0			0	N		0			0			0			1	Y
	C6-C10 Fraction	20 mg/kg	7	VOC	3 to 16	14 to 15	N	97 to 97	1	Y		0			2	Y		0		78 to 78	1	Y		0			1	Y
	C6-C10 less BTEX (F1)	20 mg/kg	7	VOC	2 to 16	14 to 15	N		0			0			0	N		0			0			0			1	Y
	C6-C9 Fraction	20 mg/kg	7	VOC	3 to 16	14 to 15	N	102 to 102	1	Y	ND	1	Y		2	Y		0		83 to 83	1	Y		0			1	Y
	Carbon disulfide		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	Naphthalene	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N	108 to 108	1	Y	ND	1	Y		0	N		0		81 to 81	1	Y		0			1	Y
PAH	4-Terphenyl-d14		0	SVOC			Y		0		ND	1	Y		0	N	56 to 100	4	N		0			0			0	N
	Acenaphthene	0.5 mg/kg	3	SVOC	3 to 16	14 to 15	N	82 to 82	1	Y	ND	1	Y		1	Y		0		82 to 87	2	Y		0			0	N
	Acenaphthylene	0.5 mg/kg	3	SVOC	3 to 16	14 to 15	N	93 to 93	1	Y	ND	1	Y		1	Y		0		89 to 93	2	Y		0			0	N
	Anthracene	0.5 mg/kg	3	SVOC	3 to 16	14 to 15	N	98 to 98	1	Y	ND	1	Y		1	Y		0		85 to 90	2	Y		0			0	N
	Benz(a)anthracene	0.5 mg/kg	3	SVOC	3 to 16	14 to 15	N	83 to 83	1	Y	ND	1	Y		1	Y		0		81 to 89	2	Y		0			0	N
	Benzo(a)pyrene	0.5 mg/kg	3	SVOC	3 to 16	14 to 15	N	87 to 87	1	Y	ND	1	Y		1	Y		0		88 to 98	2	Y		0			0	N
	Benzo(a)pyrene TEQ (lower bound)[7]	0.5 mg/kg	2	SVOC	2 to 16	14 to 15	N		0		ND	1	Y		0	N		0			0			0			0	N
	Benzo(a)pyrene TEQ (medium bound)[7]	0.5 mg/kg	2	SVOC	2 to 16	14 to 15	N		0		ND	1	Y		0	N		0			0			0			0	N
	Benzo(a)pyrene TEQ (upper bound)[7]	0.5 mg/kg	2	SVOC	2 to 16	14 to 15	N		0		ND	1	Y		0	N		0			0			0			0	N
	Benzo(b,j)fluoranthene	0.5 mg/kg	3	SVOC	3 to 16	14 to 15	N	98 to 98	1	Y	ND	1	Y		1	Y		0		91 to 96	2	Y		0			0	N
	Benzo(g,h,i)perylene	0.5 mg/kg	3	SVOC	3 to 16	14 to 15	N	80 to 80	1	Y	ND	1	Y		1	Y		0		81 to 97	2	Y		0			0	N
	Benzo(k)fluoranthene	0.5 mg/kg	3	SVOC	3 to 16	14 to 15	N	77 to 77	1	Y	ND	1	Y		1	Y		0		87 to 105	2	Y		0			0	N
	Chrysene	0.5 mg/kg	3	SVOC	3 to 16	14 to 15	N	96 to 96	1	Y	ND	1	Y		1	Y		0		94 to 106	2	Y		0			0	N
	Dibenz(a,h)anthracene	0.5 mg/kg	3	SVOC	3 to 16	14 to 15	N	90 to 90	1	Y	ND	1	Y		1	Y		0		91 to 117	2	Y		0			0	N
	Fluoranthene	0.5 mg/kg	3	SVOC	3 to 16	14 to 15	N	85 to 85	1	Y	ND	1	Y		1	Y		0		77 to 87	2	Y		0			0	N
	Fluorene	0.5 mg/kg	3	SVOC	3 to 16	14 to 15	N	93 to 93	1	Y	ND	1	Y		1	Y		0		90 to 93	2	Y		0			0	N
	Indeno(1,2,3-c,d)pyrene	0.5 mg/kg	3	SVOC	3 to 16	14 to 15	N	87 to 87	1	Y	ND	1	Y		1	Y		0		88 to 103	2	Y		0			0	N
	Naphthalene	0.5 mg/kg	3	VOC	3 to 16	14 to 15	N	97 to 97	1	Y		0			1	Y		0		83 to 94	2	Y		0			0	N
	PAHs (Total)	0.5 mg/kg	3	SVOC	2 to 16	14 to 15	N		0		ND	3	Y		0	N		0			0		ND	2	Y		0	N
	Phenanthrene	0.5 mg/kg	3	SVOC	3 to 16	14 to 15	N	96 to 96	1	Y	ND	3	Y		1	Y		0		79 to 99	2	Y	ND	2	Y		0	N
	Pyrene	0.5 mg/kg	3	SVOC	3 to 16	14 to 15	N	85 to 85	1	Y	ND	3	Y		1	Y		0		81 to 88	2	Y	ND	2	Y		0	N
	Surrogate 2-fluorobiphenyl		0	SVOC			Y		0		ND	3	Y		0	N	58 to 92	4	N		0		ND	2	Y		0	N
PAHs in Soil	4-Terphenyl-d14		0	SVOC			Y	102 to 102	1	Y	ND	3	Y		0	N	101 to 102	3	Y		0		ND	2	Y		0	N
	Acenaphthene		0	SVOC	3	3	Y		0		ND	3	Y		0	N		0			0		ND	2	Y		0	N
	Acenaphthylene		0	SVOC	3	3	Y		0		ND	3	Y		0	N		0			0		ND	2	Y		0	N
	Anthracene		0	SVOC	3	3	Y		0		ND	3	Y		0	N		0			0		ND	2	Y		0	N
	Benz(a)anthracene		0	SVOC	3	3	Y		0		ND	2	Y		0	N		0			0		ND	3	Y		0	N
	Benzo(a)pyrene		0	SVOC	3	3	Y	92 to 92	1	Y		0			0	N		0			0		ND	3	Y		0	N
	Benzo(a)pyrene TEQ (lower bound)[7]		0	SVOC	3	3	Y		0		ND	2	Y		0	N		0			0		ND	3	Y		0	N
	Benzo(a)pyrene TEQ (medium bound)[7]		0	SVOC	3	3	Y		0		ND	2	Y		0	N		0			0		ND	3	Y		0	N
	Benzo(a)pyrene TEQ (upper bound)[7]		0	SVOC	3	3	Y		0		ND	1	Y		0	N		0			0			0			0	N
	Benzo(b,j+k)fluoranthene		0	Other	3	3	Y		0			0			0	N		0			0			0			0	N
	Benzo(g,h,i)perylene		0	SVOC	3	3	Y		0		ND	1	Y		0	N		0			0			0			0	N
	Chrysene		0	SVOC	3	3	Y	91 to 91	1	Y		0			0	N		0			0			0			0	N
	Dibenz(a,h)anthracene		0	SVOC	3	3	Y		0		ND	1	Y		0	N		0			0			0			0	N
	Fluoranthene		0	SVOC	3	3	Y	94 to 94	1	Y		0			0	N		0			0			0			0	N
	Fluorene		0	SVOC	3	3	Y	105 to 105	1	Y	ND	1	Y		0	N		0			0			0			0	N
	Indeno(1,2,3-c,d)pyrene		0	SVOC	3	3	Y		0			0			0	N		0			0			0			0	N
	Naphthalene		0	VOC	3	3	Y	96 to 96	1	Y	ND	2	Y		0	N		0			0		ND	3	Y		0	N
	Phenanthrene		0	SVOC	3	3	Y	95 to 95	1	Y		0			0	N		0			0		ND	3	Y		0	N
	Pyrene		0	SVOC	3	3	Y	93 to 93	1	Y	ND	2	Y		0	N		0			0		ND	3	Y		0	N
	Total Positive PAHs		0	SVOC	3	3	Y		0		ND	2	Y		0	N		0			0			0			0	N
TCLP	pH (Leachate fluid)	0.1 PH UNITS	1	SVOC	7	14	Y		0		ND	1	Y		0	N		0			0			0			0	N
	pH (TCLP - HCl addition)	0.1 ph Units	1	other	3	14	Y		0			0			0	N		0			0			0			0	N
	pH (TCLP - initial)	0.1 ph Units	1	other	7	14	Y		0		ND	1	Y		0	N		0			0			0			0	N
	pH (TCLP - off)	0.1 ph Units	1	other	7	14	Y		0			0			0	N		0			0			0			0	N
TPH	C10-C14 Fraction	20 mg/kg	7	SVOC	3 to 16	14 to 15	N	90 to 90	1	Y	ND	1	Y		1	Y		0		94 to 128	2	Y		0			1	Y
	C10-C36 Fraction (Total)	50 mg/kg	7	SVOC	2 to 16	14 to 15	N		0		ND	2	Y		0	N		0			0		ND	3	Y		1	Y
	C15-C28 Fraction	50 mg/kg	7	SVOC	3 to 16	14 to 15	N		0			0			1	Y		0			0			0			1	Y
	C29-C36 Fraction	50 mg/kg	7	SVOC	3 to 16	14 to 15	N		0		ND	1	Y		1	Y		0			0			0			1	Y
TRH in Soil (C6-C9) NEPM	C6-C10 Fraction		0	VOC	7	7	Y	91 to 91	1	Y		0			0	N		0			0			0			0	N
	C6-C9 Fraction		0	VOC	7	7	Y	91 to 91	1	Y		0			0	N		0			0			0			0	N
	Surrogate aaa-Trifluorotoluene		0	SVOC			Y	101 to 101	1	Y	ND	1	Y		0	N	101 to 107	3	Y		0			0			0	N
TRH Soil C10-C40 NEPM	>C10-C16 Fraction		0	SVOC	4	5	Y	118 to 118	1	Y		0			0	N		0			0			0			0	N
	>C10-C40 Fraction (Total)		0	SVOC	4	5	Y		0		ND	1	Y		0	N		0			0			0			0	N
	>C16-C34 Fraction		0	SVOC	4	5	Y	96 to 96	1	Y		0			0	N		0			0			0			0	N
	>C34-C40 Fraction		0	SVOC	4	5	Y	108 to 108	1	Y	ND	1	Y		0	N		0			0			0			0	N
	C10-C14 Fraction		0	SVOC	4	5	Y	118 to 118	1	Y		0			0	N		0			0			0			0	N
	C15-C28 Fraction		0	SVOC	4	5	Y	96 to 96	1	Y	ND	1	Y		0	N		0			0			0			0	N
	C29-C36 Fraction		0	SVOC	4	5	Y	108 to 108	1	Y		0			0	N		0			0			0			0	N
	Surrogate o-Terphenyl		0	SVOC			Y	99 to 99	1	Y	ND	1	Y		0	N	87 to 99	3	Y		0			0			0	N
VOC	1,1,1,2-tetrachloroethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0			0			2	Y		0			0			0			1	Y
	1,1,1-trichloroethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N	100 to 100	1	Y	ND	1	Y		2	Y		0		93 to 93	1	Y		0			1	Y
	1,1,2,2-tetrachloroethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0			0			2	Y		0			0			0			1	Y
	1,1,2-trichloroethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0		ND	1	Y		2	Y		0			0			0			1	Y
	1,1-dichloroethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0		ND	1	Y		2	Y		0			0			0			1	Y
	1,1-dichloroethene	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N	78 to 78	1	Y	ND	1	Y		2	Y		0		83 to 83	1	Y		0			1	Y
	1,2,3-trichloropropane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0			0			2	Y		0			0			0			1	Y
	1,2,4-trimethyl benzene	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0			0			0	N		0			0			0			1	Y
	1,2-dibromoethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0			0			2	Y		0			0			0			1	Y
	1,2-Dichlorobenzene	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N	115 to 115	1	Y	ND	1	Y		2	Y		0		91 to 91	1	Y	ND	2	Y		1	Y
	1,2-dichloroethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N	124 to 124	1	Y	ND	1	Y		2	Y		0		113 to 113	1	Y	ND	2	Y		1	Y
	1,2-dichloropropane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0		ND	1	Y		2	Y		0			0		ND	2	Y		1	Y
	1,3,5-trimethyl benzene	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0		ND	1	Y		2	Y		0			0		ND	2	Y		1	Y
	1,3-dichlorobenzene	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0		ND	1	Y		2	Y		0			0		ND	2	Y		1	Y
	1,3-dichloropropane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0		ND	1	Y		2	Y		0			0		ND	2	Y		1	Y
	1,4-dichlorobenzene	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0		ND	1	Y		2	Y		0			0		ND	2	Y		1	Y
	2-Butanone (MEK)	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0		ND	1	Y		2	Y		0			0		ND	2	Y		1	Y
	2-Propanone (Acetone)	0.5 mg/kg	7	Other	3 to 16	14 to 15	Y		0		ND	1	Y		0	N		0			0		ND	2	Y		1	Y
	3-chloropropene	0.5 mg/kg	7	SVOC	3 to 16	14 to 15	N		0		ND	1	Y		2	Y		0			0		ND	2	Y		1	Y
	4-chlorotoluene	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0		ND	1	Y		2	Y		0			0		ND	2	Y		1	Y
	4-Methyl-2-pentanone (MIBK)	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0		ND	1	Y		2	Y		0			0		ND	2	Y		1	Y
	Benzene	0.1 mg/kg	7	VOC	3 to 16	14 to 15	N		0		ND	1	Y		0	N		0			0		ND	2	Y		1	Y
	Bromobenzene	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0		ND	1	Y		2	Y		0			0		ND	2	Y		1	Y
	Bromochloromethane	0.5 mg/kg	7	Other	3 to 16	14 to 15	Y		0			0			2	Y		0			0		ND	2	Y		1	Y
	Bromodichloromethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0		ND	1	Y		0	N		0			0		ND	2	Y		1	Y
	Bromomethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0		ND	1	Y		2	Y		0			0		ND	2	Y		1	Y
	Carbon disulfide	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0			0			0	N		0			0			0			1	Y
	Carbon tetrachloride	0.5 mg/kg	7	VOC	3 to 16	14 to 15	N		0			0			2	Y		0			0			0			1	Y
	Chlorinated Hydrocarbons EPAVic	0.5 mg/kg	7	VOC	2 to 16	14 to 15	N		0		ND	1	Y		0	N		0			0			0			1	Y

Filter: ALL

	Chlorobenzene	0.5 mg/kg	7	Other	3 to 16	14 to 15	Y		0		ND	1	Y		2	Y		0			0			0			1	Y
	Chloroethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	Chloroform	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	Chloromethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	cis-1,2-dichloroethene	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	cis-1,3-dichloropropene	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	Dibromochloromethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	Dibromomethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	Dichlorodifluoromethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	Dichloromethane	0.5 mg/kg	7	SVOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	Ethylbenzene	0.1 mg/kg	7	VOC	3 to 16	14 to 15	**N**	114 to 114	1	Y	ND	1	Y		0	**N**		0		84 to 84	1	Y		0			1	Y
	Iodomethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	Isopropylbenzene	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	Other Chlorinated Hydrocarbons EPAVic	0.5 mg/kg	7	VOC	2 to 16	14 to 15	**N**		0		ND	1	Y		0	**N**		0			0			0			1	Y
	Styrene	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	Surrogate 4-BFB		0	VOC			Y		0			0			0	**N**	100 to 115	8	Y		0			0			0	**N**
	Surrogate toluene-d8		0	VOC			Y		0		ND	2	Y		0	**N**	72 to 96	8	Y		0		ND	3	Y		0	**N**
	Tetrachloroethene	0.5 mg/kg	7	SVOC	3 to 16	14 to 15	**N**		0			0			2	Y		0			0		ND	3	Y		1	Y
	Toluene	0.1 mg/kg	7	VOC	3 to 16	14 to 15	**N**	106 to 106	1	Y	ND	2	Y		0	**N**		0		109 to 109	1	Y	ND	3	Y		1	Y
	Total MA[H*]	0.5 MG/KG	7	Other	2 to 16	14 to 15	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		1	Y
	trans-1,2-dichloroethene	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	trans-1,3-dichloropropene	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	Tribromomethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	Trichloroethene	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**	107 to 107	1	Y	ND	1	Y		2	Y		0		97 to 97	1	Y		0			1	Y
	Trichlorofluoromethane	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	Vinyl Chloride	0.5 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	1	Y		2	Y		0			0			0			1	Y
	Xylene (m & p)	0.2 mg/kg	7	VOC	3 to 16	14 to 15	**N**	121 to 121	1	Y		0			0	**N**		0		87 to 87	1	Y		0			1	Y
	Xylene (o)	0.1 mg/kg	7	VOC	3 to 16	14 to 15	**N**		0		ND	2	Y		0	**N**		0		88 to 88	1	Y	ND	3	Y		1	Y
	Xylene (Total)	0.3 mg/kg	7	VOC	3 to 16	14 to 15	**N**	118 to 118	1	Y	ND	2	Y		0	**N**		0		88 to 88	1	Y	ND	3	Y		1	Y
VOCs in soil	1,1,1,2-tetrachloroethane		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,1,1-trichloroethane		0	VOC	7	7	Y	89 to 89	1	Y	ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,1,2,2-tetrachloroethane		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,1,2-trichloroethane		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,1-dichloroethane		0	VOC	7	7	Y	93 to 93	1	Y	ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,1-dichloroethene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,1-dichloropropene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,2,3-trichlorobenzene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,2,3-trichloropropane		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,2,4-trichlorobenzene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,2,4-trimethyl benzene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,2-dibromo-3-chloropropane		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,2-dibromoethane		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,2-Dichlorobenzene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,2-dichloroethane		0	VOC	7	7	Y	95 to 95	1	Y	ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,2-dichloropropane		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,3,5-trimethyl benzene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,3-dichlorobenzene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,3-dichloropropane		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	1,4-dichlorobenzene		0	VOC	7	7	Y		0			0			0	**N**		0			0		ND	2	Y		0	**N**
	2,2-dichloropropane		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	2-chlorotoluene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	4-chlorotoluene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	4-isopropyl toluene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Benzene		0	VOC	7	7	Y		0			0			0	**N**		0			0		ND	3	Y		0	**N**
	Bromobenzene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Bromochloromethane		0	Other	7	7	Y		0			0			0	**N**		0			0		ND	3	Y		0	**N**
	Bromodichloromethane		0	VOC	7	7	Y	99 to 99	1	Y	ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Bromomethane		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Carbon tetrachloride		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Chlorobenzene		0	Other	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Chloroethane		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Chloroform		0	VOC	7	7	Y	95 to 95	1	Y	ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Chloromethane		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	cis-1,2-dichloroethene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	cis-1,3-dichloropropene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Cyclohexane		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Dibromochloromethane		0	VOC	7	7	Y	95 to 95	1	Y	ND	2	Y		0	**N**		0			0		ND	2	Y		0	**N**
	Dibromomethane		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Dichlorodifluoromethane		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Ethylbenzene		0	VOC	7	7	Y		0			0			0	**N**		0			0		ND	3	Y		0	**N**
	Hexachlorobutadiene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND to 0.001 mg/l	3	**N**		0	**N**
	Isopropylbenzene		0	VOC	7	7	Y		0			0			0	**N**		0			0			0			0	**N**
	n-butyl benzene		0	VOC	7	7	Y		0			0			0	**N**		0			0			0			0	**N**
	n-propyl benzene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	sec-butyl benzene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	2	Y		0	**N**
	Styrene		0	VOC	7	7	Y		0			0			0	**N**		0			0		ND	3	Y		0	**N**
	Surrogate 4-BFB		0	VOC			Y	97 to 97	1	Y	ND	2	Y		0	**N**	91 to 97	3	Y		0		ND	3	Y		0	**N**
	Surrogate aaa-Trifluorotoluene		0	SVOC			Y	90 to 90	1	Y	ND	2	Y		0	**N**	90 to 95	3	Y		0		ND	3	Y		0	**N**
	Surrogate Dibromofluoromethane		0	VOC			Y	100 to 100	1	Y	ND	2	Y		0	**N**	73 to 100	3	Y		0		ND	3	Y		0	**N**
	Surrogate toluene-d8		0	VOC			Y	100 to 100	1	Y	ND	2	Y		0	**N**	97 to 100	3	Y		0		ND	3	Y		0	**N**
	Tert-butyl benzene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Tetrachloroethene		0	SVOC	7	7	Y	92 to 92	1	Y	ND	2	Y		0	**N**		0			0		ND	3	Y		0	**N**
	Toluene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	2	Y		0	**N**
	trans-1,2-dichloroethene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	2	Y		0	**N**
	trans-1,3-dichloropropene		0	VOC	7	7	Y		0		ND	2	Y		0	**N**		0			0		ND	2	Y		0	**N**
	Tribromomethane		0	VOC	7	7	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Trichloroethene		0	VOC	7	7	Y	86 to 86	1	Y	ND	1	Y		0	**N**		0			0			0			0	**N**
	Trichlorofluoromethane		0	VOC	7	7	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Vinyl Chloride		0	VOC	7	7	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Xylene (m & p)		0	VOC	7	7	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
	Xylene (o)		0	VOC	7	7	Y		0		ND	1	Y		0	**N**		0			0			0			0	**N**
Volatile	Benzene		0	VOC			Y	93 to 93	1	Y	ND	1	Y		0	**N**		0		107 to 107	1	Y		0			0	**N**
8 HM in water - dissolved	Arsenic (Total)		0	Other	3	3	Y	104 to 104	1	Y	ND	1	Y		0	**N**		0			0			0			0	**N**
	Cadmium		0	Other	3	3	Y	106 to 106	1	Y	ND	1	Y		0	**N**		0			0			0			0	**N**
	Chromium (Total)		0	Other	3	3	Y	102 to 102	1	Y	ND	1	Y		0	**N**		0			0			0			0	**N**
	Copper		0	Other	3	3	Y	100 to 100	1	Y	ND	1	Y		0	**N**		0			0			0			0	**N**
	Lead		0	Other	3	3	Y	102 to 102	1	Y	ND	1	Y		0	**N**		0			0			0			0	**N**
	Mercury (Inorganic)		0	Other	3	3	Y	84 to 84	1	Y	ND	1	Y		0	**N**		0			0			0			0	**N**
	Nickel		0	Other	3	3	Y	100 to 100	1	Y	ND	1	Y		0	**N**		0			0			0			0	**N**
	Zinc		0	Other	3	3	Y	105 to 105	1	Y	ND	1	Y		0	**N**		0			0			0			0	**N**
F1-BTEX	C6-C10 less BTEX (F1)	0.02 mg/L	1	VOC	4	11	Y		0		ND	1	Y		0	**N**		0			0			0			1	Y

Filter: ALL

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Heavy Metal	Arsenic (Total)	0.001 mg/L	1	Other	3 to 11	11 to 15	Y	90 to 114	3	Y	ND	1	Y		1	Y		0		89 to 115	3	Y		0			0	N
	Cadmium	0.0002 mg/L	1	Other	3 to 11	11 to 15	Y	86 to 103	3	Y	ND	1	Y		1	Y		0		77 to 115	3	Y		0			0	N
	Chromium (Total)	0.001 mg/L	1	Other	3 to 11	11 to 15	Y	91 to 103	3	Y	ND	1	Y		1	Y		0		94 to 112	3	Y		0			0	N
	Copper	0.001 mg/L	1	Other	3 to 11	11 to 15	Y	91 to 105	3	Y	ND	1	Y		1	Y		0		107 to 113	3	Y		0			0	N
	Lead	0.001 mg/L	1	Other	3 to 11	11 to 15	Y	95 to 111	3	Y	ND	1	Y		1	Y		0		97 to 116	3	Y		0			0	N
	Mercury (Inorganic)	0.0001 mg/L	1	Other	3 to 11	11 to 15	Y	90 to 100	3	Y	ND	1	Y		1	Y		0		90 to 115	3	Y		0			0	N
	Nickel	0.001 mg/L	1	Other	3 to 11	11 to 15	Y	91 to 106	3	Y	ND	1	Y		1	Y		0		86 to 113	3	Y		0			0	N
	Zinc	0.005 mg/L	1	Other	3 to 11	11 to 15	Y	91 to 110	3	Y	ND	1	Y		1	Y		0		91 to 110	2	Y		0			0	N
Organic	>C10-C16 Fraction	0.05 mg/L	6	SVOC	4 to 7	11 to 15	Y	76 to 78	2	Y	ND	1	Y		0	N		0		98 to 107	2	Y		0			1	Y
	>C10-C16 less Naphthalene (F2)	0.05 mg/L	6	SVOC	2 to 4	11 to 15	Y		0		ND	1	Y		0	N		0			0			0			0	N
	>C16-C34 Fraction	0.1 mg/L	6	SVOC	4 to 7	11 to 15	Y		0		ND	1	Y		0	N		0			0			0			1	Y
	>C34-C40 Fraction	0.1 mg/L	6	SVOC	4 to 7	11 to 15	Y		0		ND	1	Y		0	N		0			0			0			1	Y
	Acenaphthene		0	SVOC			Y		0		ND	1	Y		0	N		0		104 to 104	1	Y		0			0	N
	Acenaphthylene		0	SVOC			Y	127 to 127	1	Y	ND	1	Y		0	N		0		83 to 83	1	Y		0			0	N
	Anthracene		0	SVOC			Y		0		ND	1	Y		0	N		0		86 to 86	1	Y		0			0	N
	Benz(a)anthracene		0	SVOC			Y	102 to 102	1	Y	ND	1	Y		0	N		0		75 to 75	1	Y		0			0	N
	Benzo(a)pyrene		0	SVOC			Y		0		ND	1	Y		0	N		0		79 to 79	1	Y		0			0	N
	Benzo(b,j)fluoranthene		0	SVOC			Y	100 to 100	1	Y	ND	1	Y		0	N		0		122 to 122	1	Y		0			0	N
	Benzo(g,h,i)perylene		0	SVOC			Y		0		ND	1	Y		0	N		0		71 to 71	1	Y		0			0	N
	Benzo(k)fluoranthene		0	SVOC			Y	103 to 103	1	Y	ND	1	Y		0	N		0		121 to 121	1	Y		0			0	N
	C6-C10 Fraction	0.02 mg/L	7	VOC	3 to 4	11 to 15	Y	93 to 109	2	Y	ND	1	Y		0	N		0			0			0			1	Y
	C6-C10 less BTEX (F1)	0.02 mg/L	6	VOC	2 to 4	11 to 15	Y		0		ND	1	Y		0	N		0			0			0			0	N
	C6-C9 Fraction	0.02 mg/L	7	VOC	3 to 4	11 to 15	Y	95 to 112	2	Y	ND	1	Y		0	N		0			0			0			1	Y
	Carbon disulfide		0	VOC			Y		0		ND	1	Y		0	N		0			0			0			0	N
	Chrysene		0	SVOC			Y		0		ND	1	Y		0	N		0		77 to 77	1	Y		0			0	N
	Dibenz(a,h)anthracene		0	SVOC			Y	84 to 84	1	Y	ND	1	Y		0	N		0		70 to 70	1	N		0			0	N
	Fluoranthene		0	SVOC			Y		0		ND	1	Y		0	N		0		94 to 94	1	Y		0			0	N
	Fluorene		0	SVOC			Y	106 to 106	1	Y	ND	1	Y		0	N		0		74 to 74	1	Y		0			0	N
	Indeno(1,2,3-c,d)pyrene		0	SVOC			Y		0		ND	1	Y		0	N		0		77 to 77	1	Y		0			0	N
	Naphthalene	0.01 mg/L	7	VOC	3 to 4	11 to 15	Y	81 to 105	3	Y	ND	1	Y		0	N		0			0			0			0	N
	Phenanthrene		0	SVOC			Y		0		ND	1	Y		0	N		0		106 to 106	1	Y		0			0	N
	Pyrene		0	SVOC			Y	95 to 95	1	Y		0			0	N		0		93 to 93	1	Y		0			0	N
Organics	4-Terphenyl-d14		0	SVOC			Y		0			0			0	N	56 to 109	2	N		0			0			0	N
	Acenaphthene	0.00001 mg/L	1	SVOC	4 to 11	11 to 15	Y	99 to 113	2	Y		0			0	N		0		73 to 96	2	Y		0			0	N
	Acenaphthylene	0.00001 mg/L	1	SVOC	4 to 11	11 to 15	Y	105 to 105	1	Y	ND	1	Y		0	N		0		74 to 109	2	Y		0			0	N
	Anthracene	0.00001 mg/L	1	SVOC	4 to 11	11 to 15	Y	112 to 127	2	Y	ND	1	Y		0	N		0		83 to 111	2	Y		0			0	N
	Benz(a)anthracene	0.00001 mg/L	1	SVOC	4 to 11	11 to 15	Y	110 to 110	1	Y	ND	1	Y		0	N		0		77 to 121	2	Y		0			0	N
	Benzo(a)pyrene	0.00001 mg/L	1	SVOC	4 to 11	11 to 15	Y	102 to 115	2	Y	ND	1	Y		0	N		0		83 to 120	2	Y		0			0	N
	Benzo(b,j)fluoranthene	0.00001 mg/L	1	SVOC	4 to 11	11 to 15	Y	106 to 106	1	Y	ND	1	Y		0	N		0		77 to 103	2	Y		0			0	N
	Benzo(g,h,i)perylene	0.00001 mg/L	1	SVOC	4 to 11	11 to 15	Y	91 to 95	2	Y	ND	1	Y		0	N		0		82 to 88	2	Y		0			0	N
	Benzo(k)fluoranthene	0.00001 mg/L	1	SVOC	4 to 11	11 to 15	Y	127 to 127	1	Y	ND	1	Y		0	N		0		74 to 129	2	Y		0			0	N
	Chrysene	0.00001 mg/L	1	SVOC	4 to 11	11 to 15	Y	98 to 120	2	Y	ND	1	Y		0	N		0		95 to 123	2	Y		0			0	N
	Dibenz(a,h)anthracene	0.00001 mg/L	1	SVOC	4 to 11	11 to 15	Y	112 to 112	1	Y	ND	1	Y		0	N		0		71 to 104	2	Y		0			0	N
	Fluoranthene	0.00001 mg/L	1	SVOC	4 to 11	11 to 15	Y	94 to 115	2	Y	ND	1	Y		0	N		0		76 to 125	2	Y		0			0	N
	Fluorene	0.00001 mg/L	1	SVOC	4 to 11	11 to 15	Y	111 to 111	1	Y	ND	1	Y		0	N		0		71 to 110	2	Y		0			0	N
	Indeno(1,2,3-c,d)pyrene	0.00001 mg/L	1	SVOC	4 to 11	11 to 15	Y	84 to 108	2	Y	ND	2	Y		0	N		0		76 to 100	2	Y	ND	3	Y		0	N
	Naphthalene	0.00001 mg/L	1	VOC	4 to 11	11 to 15	Y	99 to 99	1	Y		0			0	N		0		70 to 107	2	N	ND	3	Y		0	N
	PAHs (Total)	0.00001 mg/L	1	SVOC	4 to 11	11 to 15	Y		0			0			0	N		0			0			0			0	N
	Phenanthrene	0.00001 mg/L	1	SVOC	4 to 11	11 to 15	Y	113 to 124	2	Y		0			0	N		0		79 to 105	2	Y	ND	3	Y		0	N
	Pyrene	0.00001 mg/L	1	SVOC	4 to 11	11 to 15	Y	122 to 122	1	Y		0			0	N		0		79 to 121	2	Y	ND	3	Y		0	N
	Surrogate 2-fluorobiphenyl		0	SVOC			Y		0			0			0	N	50 to 82	2	N		0		ND	3	Y		0	N
PAH	4-Terphenyl-d14		0	SVOC			Y		0			0			0	N	91 to 98	2	Y		0		ND	3	Y		0	N
	Acenaphthene		0	SVOC	4 to 6	11 to 14	Y	71 to 71	1	Y	ND	1	Y		0	N		0		104 to 104	1	Y		0			0	N
	Acenaphthylene		0	SVOC	4 to 6	11 to 14	Y	77 to 77	1	Y	ND	1	Y		0	N		0		83 to 83	1	Y		0			0	N
	Anthracene		0	SVOC	4 to 6	11 to 14	Y	86 to 86	1	Y		0			0	N		0		86 to 86	1	Y		0			0	N
	Benz(a)anthracene		0	SVOC	4 to 6	11 to 14	Y	113 to 113	1	Y	ND	1	Y		0	N		0		75 to 75	1	Y		0			0	N
	Benzo(a)pyrene		0	SVOC	4 to 6	11 to 14	Y	102 to 102	1	Y	ND	1	Y		0	N		0		79 to 79	1	Y		0			0	N
	Benzo(b,j)fluoranthene		0	SVOC	4 to 6	11 to 14	Y	98 to 98	1	Y	ND	1	Y		0	N		0		122 to 122	1	Y		0			0	N
	Benzo(g,h,i)perylene		0	SVOC	4 to 6	11 to 14	Y	90 to 90	1	Y		0			0	N		0		71 to 71	1	Y		0			0	N
	Benzo(k)fluoranthene		0	SVOC	4 to 6	11 to 14	Y	98 to 98	1	Y		0			0	N		0		121 to 121	1	Y		0			0	N
	Chrysene		0	SVOC	4 to 6	11 to 14	Y	108 to 108	1	Y		0			0	N		0		77 to 77	1	Y		0			0	N
	Dibenz(a,h)anthracene		0	SVOC	4 to 6	11 to 14	Y	93 to 93	1	Y	ND	1	Y		0	N		0		70 to 70	1	N		0			0	N
	Fluoranthene		0	SVOC	4 to 6	11 to 14	Y	116 to 116	1	Y	ND	1	Y		0	N		0		94 to 94	1	Y		0			0	N
	Fluorene		0	SVOC	4 to 6	11 to 14	Y	82 to 82	1	Y	ND	1	Y		0	N		0		74 to 74	1	Y		0			0	N
	Indeno(1,2,3-c,d)pyrene		0	SVOC	4 to 6	11 to 14	Y	92 to 92	1	Y					0	N		0		77 to 77	1	Y					0	N
	Naphthalene		0	VOC	4 to 6	11 to 14	Y	71 to 71	1	Y					0	N		0		*1 Not Determined	1	N					0	N
	PAHs (Total)		0	SVOC	2 to 4	11 to 14	Y		0						0	N		0			0						0	N
	Phenanthrene		0	SVOC	4 to 6	11 to 14	Y	120 to 120	1	Y					0	N		0		106 to 106	1	Y					0	N
	Pyrene		0	SVOC	4 to 6	11 to 14	Y	115 to 115	1	Y					0	N		0		93 to 93	1	Y					0	N
	Surrogate 2-fluorobiphenyl		0	SVOC			Y		0						0	N	64 to 76	2	N		0						0	N
PAHs in Water - Low Level	4-Terphenyl-d14		0	SVOC			Y	90 to 90	1	Y					0	N	70 to 90	3	N		0						0	N
	Acenaphthene		0	SVOC	3	4	Y		0						0	N		0			0						0	N
	Acenaphthylene		0	SVOC	3	4	Y		0						0	N		0			0						0	N
	Anthracene		0	SVOC	3	4	Y		0						0	N		0			0						0	N
	Benz(a)anthracene		0	SVOC	3	4	Y		0						0	N		0			0						0	N
	Benzo(a)pyrene		0	SVOC	3	4	Y	79 to 79	1	Y					0	N		0			0						0	N
	Benzo(a)pyrene TEQ (WHO)		0	SVOC	3	4	Y		0						0	N		0			0						0	N
	Benzo(b,j+k)fluoranthene		0	Other	3	4	Y		0						0	N		0			0						0	N
	Benzo(g,h,i)perylene		0	SVOC	3	4	Y		0						0	N		0			0						0	N
	Chrysene		0	SVOC	3	4	Y	75 to 75	1	Y					0	N		0			0						0	N
	Dibenz(a,h)anthracene		0	SVOC	3	4	Y		0						0	N		0			0						0	N
	Fluoranthene		0	SVOC	3	4	Y	81 to 81	1	Y					0	N		0			0						0	N
	Fluorene		0	SVOC	3	4	Y	78 to 78	1	Y					0	N		0			0						0	N
	Indeno(1,2,3-c,d)pyrene		0	SVOC	3	4	Y		0						0	N		0			0						0	N
	Naphthalene		0	VOC	3	4	Y	94 to 94	1	Y					0	N		0			0						0	N
	Phenanthrene		0	SVOC	3	4	Y	82 to 82	1	Y					0	N		0			0						0	N
	Pyrene		0	SVOC	3	4	Y	79 to 79	1	Y					0	N		0			0						0	N
	Total Positive PAHs		0	SVOC	3	4	Y		0						0	N		0			0						0	N
TPH	C10-C14 Fraction	0.05 mg/L	6	SVOC	4 to 7	11 to 15	Y	77 to 79	2	Y					0	N		0		94 to 107	2	Y					1	Y
	C10-C36 Fraction (Total)	0.1 mg/L	6	SVOC	2 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	C15-C28 Fraction	0.1 mg/L	6	SVOC	4 to 7	11 to 15	Y		0						0	N		0			0						1	Y
	C29-C36 Fraction	0.1 mg/L	6	SVOC	4 to 7	11 to 15	Y		0						0	N		0			0						1	Y
TRH Water(C10-C40) NEPM	>C10-C16 Fraction		0	SVOC	3	4	Y	124 to 124	1	Y					0	N		0			0						0	N
	>C16-C34 Fraction		0	SVOC	3	4	Y	108 to 108	1	Y					0	N		0			0						0	N
	>C34-C40 Fraction		0	SVOC	3	4	Y	98 to 98	1	Y					0	N		0			0						0	N
	C10-C14 Fraction		0	SVOC	3	4	Y	124 to 124	1	Y					0	N		0			0						0	N
	C15-C28 Fraction		0	SVOC	3	4	Y	108 to 108	1	Y					0	N		0			0						0	N
	C29-C36 Fraction		0	SVOC	3	4	Y	86 to 86	1	Y					0	N		0			0						0	N

Filter: ALL

	Surrogate o-Terphenyl		0	SVOC			Y	98 to 98	1	Y					0	N	85 to 100	3	Y		0						0	N
VOC	1,1,1,2-tetrachloroethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	1,1,1-trichloroethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y	96 to 98	2	Y					0	N		0			0						1	Y
	1,1,2,2-tetrachloroethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	1,1,2-trichloroethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	1,1-dichloroethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	1,1-dichloroethene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y	96 to 119	2	Y					0	N		0			0						1	Y
	1,2,3-trichloropropane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	1,2,4-trimethyl benzene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	1,2-dibromoethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	1,2-Dichlorobenzene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y	90 to 101	2	Y					0	N		0			0						1	Y
	1,2-dichloroethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y	111 to 119	2	Y					0	N		0			0						1	Y
	1,2-dichloropropane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	1,3,5-trimethyl benzene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	1,3-dichlorobenzene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	1,3-dichloropropane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	1,4-dichlorobenzene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	2-Butanone (MEK)	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	2-Propanone (Acetone)	1 µg/L	7	Other	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	3-chloropropene	0.001 mg/L	7	SVOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	4-chlorotoluene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	4-Methyl-2-pentanone (MIBK)	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Benzene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						0	N
	Bromobenzene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Bromochloromethane	0.001 mg/L	7	Other	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Bromodichloromethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Bromomethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Carbon disulfide	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Carbon tetrachloride	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Chlorinated Hydrocarbons EPAVic	5 µg/L	7	VOC	2 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Chlorobenzene	0.001 mg/L	7	Other	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Chloroethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Chloroform	0.005 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Chloromethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	cis-1,2-dichloroethene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	cis-1,3-dichloropropene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Dibromochloromethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Dibromomethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Dichlorodifluoromethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Dichloromethane	0.001 mg/L	7	SVOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Ethylbenzene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y	88 to 89	2	Y					0	N		0			0						0	N
	Iodomethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Isopropylbenzene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Other Chlorinated Hydrocarbons EPAVic	5 µg/L	7	VOC	2 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Styrene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Surrogate 4-BFB		0	VOC			Y		0						0	N	104 to 119	9	Y		0						0	N
	Surrogate toluene-d8		0	VOC			Y		0						0	N	90 to 106	11	Y		0						0	N
	Tetrachloroethene	0.001 mg/L	7	SVOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Toluene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y	96 to 98	2	Y					0	N		0			0						0	N
	Total MA[H]	0.003 MG/L	7	Other	2 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	trans-1,2-dichloroethene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	trans-1,3-dichloropropene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Tribromomethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Trichloroethene	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y	94 to 97	2	Y					0	N		0			0						1	Y
	Trichlorofluoromethane	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Vinyl Chloride	0.001 mg/L	7	VOC	3 to 4	11 to 15	Y		0						0	N		0			0						1	Y
	Xylene (m & p)	0.002 mg/L	2	VOC	3 to 4	11 to 15	Y	88 to 100	2	Y					0	N		0			0						0	N
	Xylene (o)		0	VOC	3 to 4	14 to 15	Y		0						0	N		0			0						0	N
	Xylene (Total)	0.003 mg/L	7	VOC	3 to 4	11 to 15	Y	91 to 98	2	Y					0	N		0			0						0	N
VOCs in water	1,1,1,2-tetrachloroethane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	1,1,1-trichloroethane		0	VOC	2	3	Y	98 to 98	1	Y					0	N		0			0						0	N
	1,1,2,2-tetrachloroethane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	1,1,2-trichloroethane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	1,1-dichloroethane		0	VOC	2	3	Y	101 to 101	1	Y					0	N		0			0						0	N
	1,1-dichloroethene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	1,1-dichloropropene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	1,2,3-trichlorobenzene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	1,2,3-trichloropropane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	1,2,4-trichlorobenzene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	1,2,4-trimethyl benzene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	1,2-dibromo-3-chloropropane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	1,2-dibromoethane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	1,2-Dichlorobenzene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	1,2-dichloroethane		0	VOC	2	3	Y	102 to 102	1	Y					0	N		0			0						0	N
	1,2-dichloropropane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	1,3,5-trimethyl benzene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	1,3-dichlorobenzene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	1,3-dichloropropane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	1,4-dichlorobenzene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	2,2-dichloropropane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	2-chlorotoluene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	4-chlorotoluene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	4-isopropyl toluene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Benzene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Bromobenzene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Bromochloromethane		0	Other	2	3	Y		0						0	N		0			0						0	N
	Bromodichloromethane		0	VOC	2	3	Y	102 to 102	1	Y					0	N		0			0						0	N
	Bromomethane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Carbon tetrachloride		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Chlorobenzene		0	Other	2	3	Y		0						0	N		0			0						0	N
	Chloroethane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Chloroform		0	VOC	2	3	Y	104 to 104	1	Y					0	N		0			0						0	N
	Chloromethane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	cis-1,2-dichloroethene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	cis-1,3-dichloropropene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Cyclohexane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Dibromochloromethane		0	VOC	2	3	Y	99 to 99	1	Y					0	N		0			0						0	N
	Dibromomethane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Dichlorodifluoromethane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Ethylbenzene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Hexachlorobutadiene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Isopropylbenzene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	n-butyl benzene		0	VOC	2	3	Y		0						0	N		0			0						0	N

Filter: ALL

	n-propyl benzene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	sec-butyl benzene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Styrene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Surrogate 4-BFB		0	VOC			Y	101 to 101	1	Y					0	N	91 to 101	3	Y		0						0	N
	Surrogate Dibromofluoromethane		0	VOC			Y	129 to 129	1	Y					0	N	94 to 129	3	Y		0						0	N
	Surrogate toluene-d8		0	VOC			Y	96 to 96	1	Y					0	N	91 to 96	3	Y		0						0	N
	Tert-butyl benzene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Tetrachloroethene		0	SVOC	2	3	Y	94 to 94	1	Y					0	N		0			0						0	N
	Toluene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	trans-1,2-dichloroethene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	trans-1,3-dichloropropene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Tribromomethane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Trichloroethene		0	VOC	2	3	Y	113 to 113	1	Y					0	N		0			0						0	N
	Trichlorofluoromethane		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Vinyl Chloride		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Xylene (m & p)		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Xylene (o)		0	VOC	2	3	Y		0						0	N		0			0						0	N
Volatile	Benzene		0	VOC	2 to 4	11 to 13	Y	108 to 110	2	Y					0	N		0		91 to 110	2	Y					0	N
	Ethylbenzene		0	VOC	2 to 4	11 to 13	Y		0						0	N		0		93 to 98	2	Y					0	N
	Surrogate 4-BFB		0	VOC			Y		0						0	N	76 to 122	6	Y		0						0	N
	Toluene		0	VOC	2 to 4	11 to 13	Y		0						0	N		0		90 to 97	2	Y					0	N
	Xylene (m & p)	0.002 mg/L	5	VOC	2 to 4	11 to 13	Y		0						0	N		0		91 to 100	2	Y					1	Y
	Xylene (o)	0.001 mg/L	7	VOC	2 to 4	11 to 13	Y		0						0	N		0		90 to 100	2	Y					1	Y
	Xylene (Total)		0	VOC	2 to 4	11 to 13	Y		0						0	N		0		91 to 100	2	Y					0	N
vTRH & BTEXN in Water NEPM	Benzene		0	VOC	2	3	Y	98 to 98	1	Y					0	N		0			0						0	N
	C6-C10 Fraction		0	VOC	2	3	Y	91 to 91	1	Y					0	N		0			0						0	N
	C6-C10 less BTEX (F1)		0	VOC	2	3	Y		0						0	N		0			0						0	N
	C6-C9 Fraction		0	VOC	2	3	Y	91 to 91	1	Y					0	N		0			0						0	N
	Ethylbenzene		0	VOC	2	3	Y	86 to 86	1	Y					0	N		0			0						0	N
	Naphthalene		0	VOC	2	3	Y		0						0	N		0			0						0	N
	Surrogate 4-BFB		0	VOC			Y	101 to 101	1	Y					0	N	91 to 101	3	Y		0						0	N
	Surrogate Dibromofluoromethane		0	VOC			Y	129 to 129	1	Y					0	N	94 to 129	3	Y		0						0	N
	Surrogate toluene-d8		0	VOC			Y	96 to 96	1	Y					0	N	91 to 96	3	Y		0						0	N
	Toluene		0	VOC	2	3	Y	91 to 91	1	Y					0	N		0			0						0	N
	Xylene (m & p)		0	VOC	2	3	Y	90 to 90	1	Y					0	N		0			0						0	N
	Xylene (o)		0	VOC	2	3	Y	93 to 93	1	Y					0	N		0			0						0	N

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Contents

Count of Results

Matrix_Type	Sample_Type	Reg	Leached	Spike_Compounds	Surrogate
gas	Normal	1304	0	0	69
gas	MB	288	0	0	12
gas	LAB_D	128	0	0	6
GAS	Field_D	104	0	0	6
gas	LCS	39	0	0	6
SOIL	Normal	534	29	0	20
SOIL	MB	181	8	0	7
SOIL	LAB_D	143	0	0	0
SOIL	Interlab_D	97	0	0	7
SOIL	Field_D	99	0	0	4
SOIL	LCS	71	0	0	7
SOIL	MS	0	0	67	0
WATER	Normal	493	0	0	16
WATER	MB	277	0	0	8
WATER	Rinsate	254	0	0	10
WATER	LCS	138	0	0	8
WATER	Interlab_D	98	0	0	8
WATER	Field_D	92	0	0	4
WATER	MS	0	0	91	0
WATER	Trip_S	12	0	0	2
WATER	Trip_B	12	0	0	2
WATER	LAB_D	8	0	0	0

[Filter]

Contents

Holding Time Errors

SDG	Matrix_Type	SampleCode	Field_ID	Depth	Sampled_Date-Time	Volatility	ChemName	Result	Sampled_to_Extraction_Days	Sampled_to_Analysis_Days	Major_Exceedance
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	VOC	Naphthalene	0.00001	MG/l	11	15 N
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	SVOC	Acenaphthene	0.00001	MG/l	11	15 N
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	SVOC	Acenaphthylene	0.00001	MG/l	11	15 N
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	SVOC	Anthracene	0.00001	MG/l	11	15 N
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	SVOC	Benz(a)anthracene	0.00001	MG/l	11	15 N
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	SVOC	Benzo(a)pyrene	0.00001	MG/l	11	15 N
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	SVOC	Benzo(b,j)fluoranthene	0.00001	MG/l	11	15 N
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	SVOC	Benzo(g,h,i)perylene	0.00001	MG/l	11	15 N
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	SVOC	Benzo(k)fluoranthene	0.00001	MG/l	11	15 N
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	SVOC	Chrysene	0.00001	MG/l	11	15 N
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	SVOC	Dibenz(a,h)anthracene	0.00001	MG/l	11	15 N
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	SVOC	Fluoranthene	0.00001	MG/l	11	15 N
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	SVOC	Fluorene	0.00001	MG/l	11	15 N
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	SVOC	Indeno(1,2,3-c,d)pyrene	0.00001	MG/l	11	15 N
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	SVOC	Phenanthrene	0.00001	MG/l	11	15 N
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	SVOC	Pyrene	0.00001	MG/l	11	15 N
595919	WATER	M18-Ap31975	JBMW03	JBMW03	16/04/2018	SVOC	PAHs (Total)	0.00001	MG/l	11	15 N
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	1,1-dichloroethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	1,1-dichloroethene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	1,1,1-trichloroethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	1,1,1,2-tetrachloroethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	1,1,2-trichloroethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	1,1,2,2-tetrachloroethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	1,2-dibromoethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	1,2-Dichlorobenzene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	1,2-dichloroethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	1,2-dichloropropane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	1,2,3-trichloropropane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	1,2,4-trimethyl benzene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	1,3-dichlorobenzene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	1,3-dichloropropane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	1,3,5-trimethyl benzene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	1,4-dichlorobenzene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	2-Butanone (MEK)	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	4-chlorotoluene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	4-Methyl-2-pentanone (MIBK	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Benzene	0.1	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Bromobenzene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Bromodichloromethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Tribromomethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Bromomethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Carbon disulfide	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Carbon tetrachloride	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Chloroethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Chloroform	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Chloromethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	cis-1,2-dichloroethene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	cis-1,3-dichloropropene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Dibromochloromethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Dibromomethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Dichlorodifluoromethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Ethylbenzene	0.1	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Iodomethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Isopropylbenzene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Xylene (m & p)	0.2	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Xylene (o)	0.1	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Styrene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Toluene	0.1	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	trans-1,2-dichloroethene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	trans-1,3-dichloropropene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	C6-C10 Fraction	20	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	C6-C10 less BTEX (F1)	20	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	C6-C9 Fraction	20	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Trichloroethene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Trichlorofluoromethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Chlorinated Hydrocarbons EF	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Other Chlorinated Hydrocarb	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Vinyl Chloride	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Xylene (Total)	0.3	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Naphthalene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	VOC	Naphthalene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Acenaphthene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Acenaphthylene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	3-chloropropene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Anthracene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Benz(a)anthracene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Benzo(a)pyrene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Benzo(a)pyrene TEQ (lower I	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Benzo(a)pyrene TEQ (mediu	0.6	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Benzo(a)pyrene TEQ (upper	1.2	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Benzo(b,j)fluoranthene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Benzo(g,h,i)perylene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Benzo(k)fluoranthene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Chrysene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Dibenz(a,h)anthracene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Fluoranthene	0.7	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Fluorene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Indeno(1,2,3-c,d)pyrene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Dichloromethane	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Phenanthrene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Pyrene	0.7	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	Tetrachloroethene	0.5	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	PAHs (Total)	1.4	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	>C10-C16 Fraction	50	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	>C10-C16 less Naphthalene	50	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	>C16-C34 Fraction	100	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	>C34-C40 Fraction	100	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	C10-C36 Fraction (Total)	50	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	C10-C14 Fraction	20	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	C15-C28 Fraction	50	MG/KG	16	14 Y
593556	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	SVOC	C29-C36 Fraction	50	MG/KG	16	14 Y

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Field Blanks (WATER)
Filter: ALL

SDG	593556	593556	594882	593556	594882
Field ID	RINS	RINS	RINS	TB	TB
Sampled_Date/Time	10/04/2018	9/04/2018	16/04/2018	11/04/2018	16/04/2018
Sample Type	Rinsate	Rinsate	Rinsate	Trip_B	Trip_B

Method_Type	ChemName	Units	EQL					
8 HM in water - dissolved	Arsenic (Total) (Filtered)	mg/l	0.001					
	Cadmium (Filtered)	mg/l	0.0001					
	Chromium (Total) (Filtered)	mg/l	0.001					
	Copper (Filtered)	mg/l	0.001					
	Lead (Filtered)	mg/l	0.001					
	Mercury (Inorganic) (Filtered)	mg/l	0.00005					
	Nickel (Filtered)	mg/l	0.001					
	Zinc (Filtered)	mg/l	0.001					
F1-BTEX	C6-C10 less BTEX (F1)	mg/l	0.02					
Heavy Metal	Arsenic (Total)	mg/l	0.001	<0.001		<0.001		
	Cadmium	mg/l	0.0002	<0.0002		<0.0002		
	Chromium (Total)	mg/l	0.001	<0.001		<0.001		
	Copper	mg/l	0.001	<0.001		<0.001		
	Lead	mg/l	0.001	<0.001		<0.001		
	Mercury (Inorganic)	mg/l	0.0001	<0.0001		<0.0001		
	Nickel	mg/l	0.001	<0.001		<0.001		
	Zinc	mg/l	0.005	<0.005		<0.005		
Organic	C6-C9 Fraction	mg/l	0.02	<0.02	<0.02	<0.02		
	>C10-C16 Fraction	mg/l	0.05	<0.05	<0.05	<0.05		
	>C16-C34 Fraction	mg/l	0.1	<0.1	<0.1	<0.1		
	>C34-C40 Fraction	mg/l	0.1	<0.1	<0.1	<0.1		
	>C10-C16 less Naphthalene (F2)	mg/l	0.05	<0.05	<0.05	<0.05		
	C6-C10 Fraction	mg/l	0.02	<0.02	<0.02	<0.02		
	C6-C10 less BTEX (F1)	mg/l	0.02	<0.02	<0.02	<0.02		
	Acenaphthene	mg/l	0.001					
	Anthracene	mg/l	0.001					
	Benzo(a)pyrene	mg/l	0.001					
	Benzo(g,h,i)perylene	mg/l	0.001					
	Chrysene	mg/l	0.001					
	Fluoranthene	mg/l	0.001					
	Indeno(1,2,3-c,d)pyrene	mg/l	0.001					
	Naphthalene	mg/l	0.01	<0.01	<0.01	<0.01		
	Pyrene	mg/l	0.001					
	Carbon disulfide	mg/l	0.001					
Organics	Acenaphthene	mg/l	0.00001					
	Acenaphthylene	mg/l	0.00001					
	Anthracene	mg/l	0.00001					
	Benz(a)anthracene	mg/l	0.00001					
	Benzo(a)pyrene	mg/l	0.00001					
	Benzo(b,j)fluoranthene	mg/l	0.00001					
	Benzo(g,h,i)perylene	mg/l	0.00001					
	Benzo(k)fluoranthene	mg/l	0.00001					
	Chrysene	mg/l	0.00001					
	Dibenz(a,h)anthracene	mg/l	0.00001					
	Fluoranthene	mg/l	0.00001					
	Fluorene	mg/l	0.00001					
	Indeno(1,2,3-c,d)pyrene	mg/l	0.00001					
	Naphthalene	mg/l	0.00001					
	Phenanthrene	mg/l	0.00001					
	Pyrene	mg/l	0.00001					
	PAHs (Total)	mg/l	0.00001					
PAH	Acenaphthene	mg/l	0.001	<0.001		<0.001		
	Acenaphthylene	mg/l	0.001	<0.001		<0.001		
	Anthracene	mg/l	0.001	<0.001		<0.001		
	Benz(a)anthracene	mg/l	0.001	<0.001		<0.001		
	Benzo(a)pyrene	mg/l	0.001	<0.001		<0.001		
	Benzo(b,j)fluoranthene	mg/l	0.001	<0.001		<0.001		
	Benzo(g,h,i)perylene	mg/l	0.001	<0.001		<0.001		
	Benzo(k)fluoranthene	mg/l	0.001	<0.001		<0.001		
	Chrysene	mg/l	0.001	<0.001		<0.001		
	Dibenz(a,h)anthracene	mg/l	0.001	<0.001		<0.001		
	Fluoranthene	mg/l	0.001	<0.001		<0.001		
	Fluorene	mg/l	0.001	<0.001		<0.001		
	Indeno(1,2,3-c,d)pyrene	mg/l	0.001	<0.001		<0.001		
	Naphthalene	mg/l	0.001	<0.001		<0.001		
	Phenanthrene	mg/l	0.001	<0.001		<0.001		
	Pyrene	mg/l	0.001	<0.001		<0.001		
	PAHs (Total)	mg/l	0.001	<0.001		<0.001		
PAHs in Water - Low Level	Acenaphthene	mg/l	0.0001					
	Acenaphthylene	mg/l	0.0001					
	Anthracene	mg/l	0.0001					
	Benz(a)anthracene	mg/l	0.0001					
	Benzo(a)pyrene	mg/l	0.0001					
	Benzo(a)pyrene TEQ (WHO)	mg/l	0.0005					
	Benzo(g,h,i)perylene	mg/l	0.0001					
	Chrysene	mg/l	0.0001					
	Dibenz(a,h)anthracene	mg/l	0.0001					
	Fluoranthene	mg/l	0.0001					
	Fluorene	mg/l	0.0001					
	Indeno(1,2,3-c,d)pyrene	mg/l	0.0001					
	Naphthalene	mg/l	0.0002					
	Phenanthrene	mg/l	0.0001					
	Pyrene	mg/l	0.0001					
	Total Positive PAHs	mg/l						
TPH	C10-C14 Fraction	mg/l	0.05	<0.05	<0.05	<0.05		
	C15-C28 Fraction	mg/l	0.1	<0.1	<0.1	<0.1		
	C29-C36 Fraction	mg/l	0.1	<0.1	<0.1	<0.1		
	C10-C36 Fraction (Total)	mg/l	0.1	<0.1	<0.1	<0.1		
TRH Water(C10-C40) NEPM	C10-C14 Fraction	mg/l	0.05					
	C15-C28 Fraction	mg/l	0.1					
	C29-C36 Fraction	mg/l	0.1					
	>C10-C16 Fraction	mg/l	0.05					
	>C16-C34 Fraction	mg/l	0.1					
	>C34-C40 Fraction	mg/l	0.1					
VOC	Total MAH*	mg/l	0.003	<0.003	<0.003	<0.003		
	1,1,1,2-tetrachloroethane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,1,1-trichloroethane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,1,2,2-tetrachloroethane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,1,2-trichloroethane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,1-dichloroethane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,2,3-trichloropropane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,2-dichloroethane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,2-dichloropropane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,3-dichloropropane	mg/l	0.001	<0.001	<0.001	<0.001		
	Bromochloromethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Carbon tetrachloride	mg/l	0.001	<0.001	<0.001	<0.001		
	Chloroethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Chloromethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Dichlorodifluoromethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Dichloromethane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,1-dichloroethene	mg/l	0.001	<0.001	<0.001	<0.001		
	3-chloropropene	mg/l	0.001	<0.001	<0.001	<0.001		
	4-chlorotoluene	mg/l	0.001	<0.001	<0.001	<0.001		
	cis-1,2-dichloroethene	mg/l	0.001	<0.001	<0.001	<0.001		
	cis-1,3-dichloropropene	mg/l	0.001	<0.001	<0.001	<0.001		
	Tetrachloroethene	mg/l	0.001	<0.001	<0.001	<0.001		
	trans-1,2-dichloroethene	mg/l	0.001	<0.001	<0.001	<0.001		
	trans-1,3-dichloropropene	mg/l	0.001	<0.001	<0.001	<0.001		
	Trichloroethene	mg/l	0.001	<0.001	<0.001	<0.001		
	Trichlorofluoromethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Vinyl Chloride	mg/l	0.001	<0.001	<0.001	<0.001		

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Field Blanks (WATER)
Filter: ALL

			SDG	593556	593556	594882	593556	594882
			Field ID	RINS	RINS	RINS	TB	TB
			Sampled_Date/Time	10/04/2018	9/04/2018	16/04/2018	11/04/2018	16/04/2018
			Sample Type	Rinsate	Rinsate	Rinsate	Trip_B	Trip_B
	Bromodichloromethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Chloroform	mg/l	0.005	<0.005	<0.005	<0.005		
	Dibromochloromethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Tribromomethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Benzene	mg/l	0.001	<0.001	<0.001			
	Ethylbenzene	mg/l	0.001	<0.001	<0.001			
	Toluene	mg/l	0.001	<0.001	<0.001			
	Xylene (o)	mg/l	0.001	<0.001	<0.001			
	Xylene (m & p)	mg/l	0.002	<0.002	<0.002			
	Xylene (Total)	mg/l	0.003	<0.003	<0.003			
	1,2,4-trimethyl benzene	mg/l	0.001	<0.001	<0.001	<0.001		
	1,3,5-trimethyl benzene	mg/l	0.001	<0.001	<0.001	<0.001		
	Bromobenzene	mg/l	0.001	<0.001	<0.001	<0.001		
	Isopropylbenzene	mg/l	0.001	<0.001	<0.001	<0.001		
	Styrene	mg/l	0.001	<0.001	**0.001**	<0.001		
	1,2-dibromoethane	mg/l	0.001	<0.001	<0.001	<0.001		
	2-Butanone (MEK)	mg/l	0.001	<0.001	<0.001	<0.001		
	4-Methyl-2-pentanone (MIBK)	mg/l	0.001	<0.001	<0.001	<0.001		
	Bromomethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Dibromomethane	mg/l	0.001	<0.001	<0.001	<0.001		
	Iodomethane	mg/l	0.001	<0.001	<0.001	<0.001		
	1,2-Dichlorobenzene	mg/l	0.001	<0.001	<0.001	<0.001		
	1,3-dichlorobenzene	mg/l	0.001	<0.001	<0.001	<0.001		
	1,4-dichlorobenzene	mg/l	0.001	<0.001	<0.001	<0.001		
	Chlorobenzene	mg/l	0.001	<0.001	<0.001	<0.001		
	2-Propanone (Acetone)	µg/l	1	<1	<5	<1		
	Carbon disulfide	mg/l	0.001	<0.001	<0.001	<0.001		
	Chlorinated Hydrocarbons EPAVic	µg/l	5	<5	<5	<5		
	Other Chlorinated Hydrocarbons EPAVic	µg/l	5	<5	<5	<5		
VOCs in water	1,1,1,2-tetrachloroethane	mg/l	0.001					
	1,1,1-trichloroethane	mg/l	0.001					
	1,1,2,2-tetrachloroethane	mg/l	0.001					
	1,1,2-trichloroethane	mg/l	0.001					
	1,1-dichloroethane	mg/l	0.001					
	1,2,3-trichloropropane	mg/l	0.001					
	1,2-dibromo-3-chloropropane	mg/l	0.001					
	1,2-dichloroethane	mg/l	0.001					
	1,2-dichloropropane	mg/l	0.001					
	1,3-dichloropropane	mg/l	0.001					
	2,2-dichloropropane	mg/l	0.001					
	Bromochloromethane	mg/l	0.001					
	Carbon tetrachloride	mg/l	0.001					
	Chloroethane	mg/l	0.01					
	Chloromethane	mg/l	0.01					
	Dichlorodifluoromethane	mg/l	0.01					
	1,1-dichloroethene	mg/l	0.001					
	1,1-dichloropropene	mg/l	0.001					
	2-chlorotoluene	mg/l	0.001					
	4-chlorotoluene	mg/l	0.001					
	cis-1,2-dichloroethene	mg/l	0.001					
	cis-1,3-dichloropropene	mg/l	0.001					
	Tetrachloroethene	mg/l	0.001					
	trans-1,2-dichloroethene	mg/l	0.001					
	trans-1,3-dichloropropene	mg/l	0.001					
	Trichloroethene	mg/l	0.001					
	Trichlorofluoromethane	mg/l	0.01					
	Vinyl Chloride	mg/l	0.01					
	Bromodichloromethane	mg/l	0.001					
	Chloroform	mg/l	0.001					
	Dibromochloromethane	mg/l	0.001					
	Tribromomethane	mg/l	0.001					
	Benzene	mg/l	0.001					
	Ethylbenzene	mg/l	0.001					
	Toluene	mg/l	0.001					
	Xylene (o)	mg/l	0.001					
	Xylene (m & p)	mg/l	0.002					
	1,2,4-trimethyl benzene	mg/l	0.001					
	1,3,5-trimethyl benzene	mg/l	0.001					
	4-isopropyl toluene	mg/l	0.001					
	Bromobenzene	mg/l	0.001					
	Isopropylbenzene	mg/l	0.001					
	n-butyl benzene	mg/l	0.001					
	n-propyl benzene	mg/l	0.001					
	sec-butyl benzene	mg/l	0.001					
	Styrene	mg/l	0.001					
	Tert-butyl benzene	mg/l	0.001					
	1,2-dibromoethane	mg/l	0.001					
	Bromomethane	mg/l	0.01					
	Cyclohexane	mg/l	0.001					
	Dibromomethane	mg/l	0.001					
	1,2,3-trichlorobenzene	mg/l	0.001					
	1,2,4-trichlorobenzene	mg/l	0.001					
	1,2-Dichlorobenzene	mg/l	0.001					
	1,3-dichlorobenzene	mg/l	0.001					
	1,4-dichlorobenzene	mg/l	0.001					
	Chlorobenzene	mg/l	0.001					
	Hexachlorobutadiene	mg/l	0.001					
Volatile	Benzene	mg/l	0.001			<0.001	<0.001	<0.001
	Ethylbenzene	mg/l	0.001			<0.001	<0.001	<0.001
	Toluene	mg/l	0.001			<0.001	<0.001	<0.001
	Xylene (o)	mg/l	0.001			<0.001	<0.001	<0.001
	Xylene (m & p)	mg/l	0.002			<0.002	<0.002	<0.002
	Xylene (Total)	mg/l	0.003			<0.003	<0.003	<0.003
vTRH & BTEXN in Water NEPM	C6-C9 Fraction	mg/l	0.01					
	C6-C10 Fraction	mg/l	0.01					
	C6-C10 less BTEX (F1)	mg/l	0.01					
	Benzene	mg/l	0.001					
	Ethylbenzene	mg/l	0.001					
	Toluene	mg/l	0.001					
	Xylene (o)	mg/l	0.001					
	Xylene (m & p)	mg/l	0.002					
	Naphthalene	mg/l	0.001					

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Field Duplicates (SOIL)
Filter: ALL

	SDG	593556	593556		593556	593556		593556	ENVIROLAB 2018-04-11T00:00:00		593556	ENVIROLAB 2018-04-11T00:00:00	
	Field ID	JBMW03 8.0-8.2	QA 9-4	RPD	JBMW04 0.2-0.3	QA 10-4	RPD	JBMW04 0.2-0.3	QC 10-4	RPD	JBMW03 8.0-8.2	QA 9-4	RPD
	Sampled Date/Time	9/04/2018	9/04/2018		10/04/2018	10/04/2018		10/04/2018	10/04/2018		9/04/2018	9/04/2018	
Method_T	ChemNam	Units	EQL										
VOC	Total MAH	mg/kg	0.5	<0.5	<0.5	0						<0.5		
	Chlorinate	mg/kg	0.5	<0.5	<0.5	0						<0.5		
	Other Chlo	mg/kg	0.5	<0.5	<0.5	0						<0.5		
Heavy Met	Arsenic (T	mg/kg	2 (Primary): 4 (Interlab)				7.4	4.9	41	7.4	7.0	6			
	Cadmium	mg/kg	0.4				**0.6**	**1.8**	**100**	**0.6**	**4.1**	**149**			
	Chromium	mg/kg	5 (Primary): 1 (Interlab)				15.0	21.0	33	15.0	16.0	6			
	Copper	mg/kg	5 (Primary): 1 (Interlab)				42.0	58.0	32	42.0	42.0	0			
	Lead	mg/kg	5 (Primary): 1 (Interlab)				210.0	200.0	5	210.0	240.0	13			
	Mercury (I	mg/kg	0.1				**0.2**	**1.3**	**147**	**0.2**	**0.6**	**100**			
	Nickel	mg/kg	5 (Primary): 1 (Interlab)				**13.0**	**32.0**	**84**	13.0	13.0	0			
	Zinc	mg/kg	5 (Primary): 1 (Interlab)				370.0	470.0	24	**370.0**	**690.0**	**60**			
al															
VOC	1,1,1,2-tetr	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	1,1,1-trichl	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	1,1,2,2-tetr	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	1,1,2-trichl	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	1,1-dichlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	1,2,3-trichl	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	1,2-dichlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	1,2-dichlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	1,3-dichlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	Bromochlo	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	Carbon tet	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	Chloroetha	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	Chlorometh	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	Dichlorodifl	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	Dichlorome	mg/kg	0.5	<0.5	<0.5	0						<0.5		
	Trichlorofl	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	1,1-dichlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	3-chloropro	mg/kg	0.5	<0.5	<0.5	0						<0.5		
	4-chlorotol	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	cis-1,2-dic	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	cis-1,3-dic	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	Tetrachlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	trans-1,2-d	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	trans-1,3-d	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	Trichloroet	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	Vinyl Chlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	Bromodich	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	Chloroform	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	Dibromoch	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
	Tribromom	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0						<0.5	<1.0	0
Organic	C6-C9 Fra	mg/kg	20 (Primary): 25 (Interla	<20.0	<20.0	0						<20.0	<25.0	0
TPH	C10-C14 F	mg/kg	20 (Primary): 50 (Interla	<20.0	<20.0	0						<20.0	<50.0	0
	C15-C28 F	mg/kg	50 (Primary): 100 (Interl	<50.0	<50.0	0						<50.0	<100.0	0
	C29-C36 F	mg/kg	50 (Primary): 100 (Interl	<50.0	<50.0	0						<50.0	<100.0	0
	C10-C36 F	mg/kg	50	<50.0	<50.0	0						<50.0		
Organic	>C10-C16	mg/kg	50	<50.0	<50.0	0						<50.0	<50.0	0
	>C16-C34	mg/kg	100	<100.0	<100.0	0						<100.0	<100.0	0
	>C34-C40	mg/kg	100	<100.0	<100.0	0						<100.0	<100.0	0
	>C10-C16	mg/kg	50	<50.0	<50.0	0						<50.0		
	C6-C10 Fr	mg/kg	20 (Primary): 25 (Interla	<20.0	<20.0	0						<20.0	<25.0	0
	C6-C10 les	mg/kg	20	<20.0	<20.0	0						<20.0		
VOC	Benzene	mg/kg	0.1 (Primary): 0.2 (Interl	<0.1	<0.1	0						<0.1	<0.2	0
	Ethylbenze	mg/kg	0.1 (Primary): 1 (Interlab	<0.1	<0.1	0						<0.1	<1.0	0
	Toluene	mg/kg	0.1 (Primary): 0.5 (Interl	<0.1	<0.1	0						<0.1	<0.5	0
	Xylene (o)	mg/kg	0.1 (Primary): 1 (Interlab	<0.1	<0.1	0						<0.1	<1.0	0
	Xylene (m	mg/kg	0.2 (Primary): 2 (Interlab	<0.2	<0.2	0						<0.2	<2.0	0
	Xylene (To	mg/kg	0.3	<0.3	<0.3	0						<0.3		
Organic	Naphthale	mg/kg	0.5 (Primary): 0.1 (Interl	<0.5	<0.5	0	<0.5			<0.5	<0.1	0	<0.5		
PAH	Acenaphth	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5	<0.5	0	<0.5	<0.1	0			
	Acenaphth	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5	<0.5	0	<0.5	<0.1	0			
	Anthracen	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5	<0.5	0	<0.5	<0.1	0			
	Benz(a)an	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5	<0.5	0	<0.5	0.2	0			
	Benzo(a)py	mg/kg	0.5 (Primary): 0.05 (Interlab)				<0.5	<0.5	0	<0.5	0.3	0			

Filter: ALL

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Field Duplicates (SOIL)
Filter: ALL

			SDG	593556	593556		593556	593556		593556	ENVIROLAB 2018-04-11T00:00:00		593556	ENVIROLAB 2018-04-11T00:00:00	
			Field ID	JBMW03 8.0-8.2	QA 9-4	**RPD**	JBMW04 0.2-0.3	QA 10-4	**RPD**	JBMW04 0.2-0.3	QC 10-4	**RPD**	JBMW03 8.0-8.2	QA 9-4	**RPD**
			Sampled Date/Time	9/04/2018	9/04/2018		10/04/2018	10/04/2018		10/04/2018	10/04/2018		9/04/2018	9/04/2018	
	Benzo(a)p	mg/kg	0.5				<0.5	<0.5	0	<0.5	<0.5	0			
	Benzo(a)p	mg/kg	0.5				0.6	0.6	0	0.6	0.5	18			
	Benzo(a)p	mg/kg	0.5				1.2	1.2	0	**1.2**	**0.6**	**67**			
	Benzo(b,j)f	mg/kg	0.5				<0.5	<0.5	0	<0.5					
	Benzo(g,h,	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5	<0.5	0	<0.5	0.3	0			
	Benzo(k)flu	mg/kg	0.5				<0.5	<0.5	0	<0.5					
	Chrysene	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5	<0.5	0	<0.5	0.3	0			
	Dibenz(a,h	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5	<0.5	0	<0.5	<0.1	0			
	Fluoranthe	mg/kg	0.5 (Primary): 0.1 (Interlab)				0.7	<0.5	33	0.7	0.6	15			
	Fluorene	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5	<0.5	0	<0.5	<0.1	0			
	Indeno(1,2	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5	<0.5	0	<0.5	0.3	0			
	Naphthaler	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5	<0.5	0	<0.5	<0.1	0			
	Phenanthr	mg/kg	0.5 (Primary): 0.1 (Interlab)				<0.5	<0.5	0	<0.5	0.2	0			
	Pyrene	mg/kg	0.5 (Primary): 0.1 (Interlab)				0.7	<0.5	33	0.7	0.6	15			
	PAHs (Tot	mg/kg	0.5				**1.4**	**<0.5**	**95**	1.4					
VOC	1,2,4-trime	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0							<0.5	<1.0	0
	1,3,5-trime	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0							<0.5	<1.0	0
	Bromoben	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0							<0.5	<1.0	0
	Isopropylb	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0							<0.5	<1.0	0
	Styrene	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0							<0.5	<1.0	0
	1,2-dibrom	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0							<0.5	<1.0	0
	2-Butanon	mg/kg	0.5	<0.5	<0.5	0							<0.5		
	4-Methyl-2	mg/kg	0.5	<0.5	<0.5	0							<0.5		
	Bromomet	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0							<0.5	<1.0	0
	Dibromom	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0							<0.5	<1.0	0
	Iodometha	mg/kg	0.5	<0.5	<0.5	0							<0.5		
	1,2-Dichlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0							<0.5	<1.0	0
	1,3-dichlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0							<0.5	<1.0	0
	1,4-dichlor	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0							<0.5	<1.0	0
	Chloroben	mg/kg	0.5 (Primary): 1 (Interlab	<0.5	<0.5	0							<0.5	<1.0	0
	2-Propano	mg/kg	0.5	<0.5	<0.5	0							<0.5		
	Carbon dis	mg/kg	0.5	<0.5	<0.5	0							<0.5		
Inorganic	% Moisture	%	1	14.0	19.0	30	12.0	10.0	18	12.0			14.0		

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (1-20 x EQL); 50 (20-30 x EQL); 50 (> 30 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Field Duplicates (WATER)
Filter: ALL

SDG	594882	594882		594882	594882		594882	ENVIROLAB 2018-04-18T00:00:00		594882	ENVIROLAB 2018-04-18T00:00:00	
Field ID	JBMW01	QC20180416	RPD	JBMW03	QC20180416-1	RPD	JBMW01	QA20180416	RPD	JBMW03	QA20180416-1	RPD
Sampled Date/Time	16/04/2018	16/04/2018		16/04/2018	16/04/2018		16/04/2018	16/04/2018		16/04/2018	16/04/2018	

Method_T	ChemNam	Units	EQL												
VOC	Total MAH	µg/l	0.003	<0.003	<0.003	0				<0.003					
	Chlorinated	µg/l	5	<5.0	<5.0	0				<5.0					
	Other Chlo	µg/l	5	<5.0	<5.0	0				<5.0					
	1,1,1,2-tetr	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	1,1,1-trichl	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	1,1,2,2-tetr	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	1,1,2-trichl	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	1,1-dichlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	1,2,3-trichl	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	1,2-dichlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	1,2-dichlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	1,3-dichlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	Bromochlo	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	Carbon tet	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	Chloroetha	mg/l	0.001 (Primary): 0.01 (Ir	<0.001	<0.001	0				<0.001	<0.01	0			
	Chloromet	mg/l	0.001 (Primary): 0.01 (Ir	<0.001	<0.001	0				<0.001	<0.01	0			
	Dichlorodif	mg/l	0.001 (Primary): 0.01 (Ir	<0.001	<0.001	0				<0.001	<0.01	0			
	Dichlorome	mg/l	0.001	<0.001	<0.001	0				<0.001					
	Trichlorofu	mg/l	0.001 (Primary): 0.01 (Ir	<0.001	<0.001	0				<0.001	<0.01	0			
	1,1-dichlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	3-chloropr	mg/l	0.001	<0.001	<0.001	0				<0.001					
	4-chlorotol	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	cis-1,2-dich	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	cis-1,3-dich	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	Tetrachlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	trans-1,2-d	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	trans-1,3-d	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	Trichloroet	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	Vinyl Chlor	mg/l	0.001 (Primary): 0.01 (Ir	<0.001	<0.001	0				<0.001	<0.01	0			
	Bromodich	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	Chloroform	mg/l	0.005 (Primary): 0.001 (	<0.005	<0.005	0				<0.005	<0.001	0			
	Dibromoch	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	Tribromom	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
Organic	C6-C9 Fra	mg/l	0.02 (Primary): 0.01 (Int	<0.02	<0.02	0				<0.02	<0.01	0			
TPH	C10-C14 F	mg/l	0.05				<0.05	<0.05	0				<0.05	<0.05	0
	C15-C28 F	mg/l	0.1				<0.1	<0.1	0				<0.1	<0.1	0
	C29-C36 F	mg/l	0.1				<0.1	<0.1	0				<0.1	<0.1	0
	C10-C36 F	mg/l	0.1				<0.1	<0.1	0				<0.1		
Organic	>C10-C16	mg/l	0.05				<0.05	<0.05	0				<0.05	<0.05	0
	>C16-C34	mg/l	0.1				<0.1	<0.1	0				<0.1	<0.1	0
	>C34-C40	mg/l	0.1				<0.1	<0.1	0				<0.1	<0.1	0
	C6-C10 Fr	mg/l	0.02 (Primary): 0.01 (Int	<0.02	<0.02	0				<0.02	<0.01	0			
	C6-C10 les	mg/l	0.02 (Primary): 0.01 (Int	<0.02	<0.02	0				<0.02	<0.01	0			
VOC	Benzene	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	Ethylbenze	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	Toluene	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
Volatile	Xylene (o)	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	Xylene (m	mg/l	0.002	<0.002	<0.002	0				<0.002	<0.002	0			
Organic	Naphthaler	mg/l	0.01 (Primary): 0.001 (Ir	<0.01			<0.01			<0.01	<0.001	0	<0.01	<0.0002	0
Organics	Acenaphth	mg/l	0.00001 (Primary): 0.0001	(Interlab)			<0.00001	<0.00001	0				<0.00001	<0.0001	0
	Acenaphth	mg/l	0.00001 (Primary): 0.0001	(Interlab)			<0.00001	<0.00001	0				<0.00001	<0.0001	0
	Anthracene	mg/l	0.00001 (Primary): 0.0001	(Interlab)			<0.00001	<0.00001	0				<0.00001	<0.0001	0
	Benz(a)ant	mg/l	0.00001 (Primary): 0.0001	(Interlab)			<0.00001	<0.00001	0				<0.00001	<0.0001	0
	Benzo(a)py	mg/l	0.00001 (Primary): 0.0001	(Interlab)			<0.00001	<0.00001	0				<0.00001	<0.0001	0
	Benzo(b,j)fl	mg/l	0.00001				<0.00001	<0.00001	0				<0.00001		
	Benzo(g,h,i	mg/l	0.00001 (Primary): 0.0001	(Interlab)			<0.00001	<0.00001	0				<0.00001	<0.0001	0
	Benzo(k)fl	mg/l	0.00001				<0.00001	<0.00001	0				<0.00001		
	Chrysene	mg/l	0.00001 (Primary): 0.0001	(Interlab)			<0.00001	<0.00001	0				<0.00001	<0.0001	0
	Dibenz(a,h	mg/l	0.00001 (Primary): 0.0001	(Interlab)			<0.00001	<0.00001	0				<0.00001	<0.0001	0
	Fluoranthe	mg/l	0.00001 (Primary): 0.0001	(Interlab)			<0.00001	<0.00001	0				<0.00001	<0.0001	0
	Fluorene	mg/l	0.00001 (Primary): 0.0001	(Interlab)			<0.00001	<0.00001	0				<0.00001	<0.0001	0
	Indeno(1,2	mg/l	0.00001 (Primary): 0.0001	(Interlab)			<0.00001	<0.00001	0				<0.00001	<0.0001	0
	Naphthaler	mg/l	0.00001 (Primary): 0.0002	(Interlab)			<0.00001	<0.00001	0				<0.00001	<0.0002	0
	Phenanthr	mg/l	0.00001 (Primary): 0.0001	(Interlab)			<0.00001	<0.00001	0				<0.00001	<0.0001	0
	Pyrene	mg/l	0.00001 (Primary): 0.0001	(Interlab)			<0.00001	<0.00001	0				<0.00001	<0.0001	0
	PAHs (Tot	mg/l	0.00001				<0.00001	<0.00001	0				<0.00001		
VOC	1,2,4-trime	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	1,3,5-trime	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	Bromoben	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	Isopropylb	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	Styrene	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	1,2-dibrom	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	2-Butanon	mg/l	0.001	<0.001	<0.001	0				<0.001					
	4-Methyl-2	mg/l	0.001	<0.001	<0.001	0				<0.001					
	Bromomet	mg/l	0.001 (Primary): 0.01 (Ir	<0.001	<0.001	0				<0.001	<0.01	0			
	Dibromom	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	Iodometha	mg/l	0.001	<0.001	<0.001	0				<0.001					
	1,2-Dichlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	1,3-dichlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	1,4-dichlor	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	Chloroben	mg/l	0.001	<0.001	<0.001	0				<0.001	<0.001	0			
	2-Propano	µg/l	1	<1.0	<1.0	0				<1.0					
	Carbon dis	mg/l	0.001	<0.001	<0.001	0				<0.001					

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (1-20 x EQL); 50 (20-30 x EQL); 50 (> 30 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Field Duplicates (GAS)
Filter: ALL

SDG	594882	594882		594882	594882		
Field ID	SV15 - FRONT	QC20180417 - FRONT	**RPD**	SV15 - BACK	QC20180417 - BACK	**RPD**	
Sampled Date/Time	17/04/2018	17/04/2018		17/04/2018	17/04/2018		

Method_T	ChemNam	Units	EQL						
Organic	Isopropyl a	µg/m3	400	<400.0	<400.0	0	<400.0	<400.0	0
Volatile	1,1,1,2-tetr	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,1,1-trichl	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,1,2,2-tetr	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,1,2-trichl	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,1-dichlor	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,2,3-trichl	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,2-dibrom	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,2-dichlor	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,2-dichlor	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,3-dichlor	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	2,2-dichlor	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	Bromochlo	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	Carbon tet	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	Trichlorofl	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,1-dichlor	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,1-dichlor	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	2-chlorotol	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	4-chlorotol	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	cis-1,2-dicl	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	cis-1,3-dicl	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	Tetrachlor	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	trans-1,3-d	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	Trichloroet	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	Vinyl Chlor	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	Bromodich	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	Chloroform	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	Dibromoch	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	Tribromom	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	Benzene	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	Ethylbenze	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	Toluene	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	Xylene (To	µg/m3	60	<60.0	<60.0	0	<60.0	<60.0	0
	Naphthaler	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,2,4-trime	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,3,5-trime	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	4-isopropy	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	Isopropylb	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	n-butyl ben	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	n-propyl be	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	sec-butyl b	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	Styrene	µg/m3	200	<200.0	<200.0	0	<200.0	<200.0	0
	Tert-butyl b	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,2-dibrom	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	Dibromom	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,2,3-trichl	TOTAL UG	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,2,4-trichl	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,2-Dichlor	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,3-dichlor	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	1,4-dichlor	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	Chloroben	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0
	Hexachlor	µg/m3	20	<20.0	<20.0	0	<20.0	<20.0	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 50 (1-20 x EQL); 50 (20-30 x EQL); 50 (> 30 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Contents

Surrogate Variation > 30% or outside lab LCL or UCL

SDG	Expr1001	Lab_Report_Number	Sample_Type	Matrix_Type	SampleCode	Field_ID	Depth	Sampled_Date-Time	Compound	Recovery %	Unit	LCL	UCL	Lab_Qualifier	Lab_Comments
593556	593556	593556	Normal	SOIL	M18-Ap12240	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	2-Fluorobiphenyl (surr.)	58	%	50	150		
593556	593556	593556	Normal	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	2-Fluorobiphenyl (surr.)	61	%	50	150		
593556	593556	593556	Normal	SOIL	M18-Ap29342	JBMW04 0.2-0.3	JBMW040.2 - 0.3	10/04/2018	p-Terphenyl-d14 (surr.)	56	%	50	150		
594882	594882	594882	Rinsate	WATER	M18-Ap23278	RINS	RINS	16/04/2018	2-Fluorobiphenyl (surr.)	64	%	50	150		
594882	594882	594882	Field_D	WATER	M18-Ap23280	QC20180416-1	JBMW037.33	16/04/2018	2-Fluorobiphenyl (surr.)	50	%	50	150		
594882	594882	594882	Field_D	WATER	M18-Ap23280	QC20180416-1	JBMW037.33	16/04/2018	p-Terphenyl-d14 (surr.)	56	%	50	150		
594882	594882	594882	Normal	GAS	M18-Ap23252	SV12 - BACK	SV120.25	17/04/2018	4-Bromofluorobenzene (sui	66	%	50	150		
594882	594882	594882	Normal	GAS	M18-Ap23257	SV15 - FRONT	SV150.25	17/04/2018	4-Bromofluorobenzene (sui	61	%	50	150		
594882	594882	594882	Normal	GAS	M18-Ap23258	SV15 - BACK	SV150.25	17/04/2018	4-Bromofluorobenzene (sui	61	%	50	150		

Contents

Matrix Spike Recoveries less than 70% or greater than 130% or outside lab LCL or UCL

SDG	Lab_Report_Number	Matrix_Type	SampleCode	Field_ID	Depth	Sampled_Date-Time	Method_Name	Compound	Recovery %	Result_Type	LCL	UCL	Lab_Comments
593556	593556	SOIL	NCP_Ap24747_593556-SPK			10/04/2018	LTM-MET-3030 by ICP-OES (hydride ICP-OES for Mercury)	Zinc	132	SC			The matrix spike recovery is outside of the recommended acceptance criteria. An acceptable recovery was obtained for the laboratory control sample indicating a sample matrix interference

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Contents

Trip Spike Recoveries (70% - 130% is acceptable)

SDG	Lab_Report_Number	Matrix_Type	SampleCode	Field_ID	Method_Name	Compound	Trip_Spike_Result	Trip_Spike_Control	Result_Units	Spike_Recovery_%	Acceptable	Result_Type	Lab_Comments
593556	593556	WATER	M18-Ap12245	TS	TRH C6-C40 - LTM-ORG-2010	Benzene	NA	NA	NA	91	Y	REG	
593556	593556	WATER	M18-Ap12245	TS	TRH C6-C40 - LTM-ORG-2010	Ethylbenzene	NA	NA	NA	93	Y	REG	
593556	593556	WATER	M18-Ap12245	TS	TRH C6-C40 - LTM-ORG-2010	m&p-Xylenes	NA	NA	NA	91	Y	REG	
593556	593556	WATER	M18-Ap12245	TS	TRH C6-C40 - LTM-ORG-2010	o-Xylene	NA	NA	NA	90	Y	REG	
593556	593556	WATER	M18-Ap12245	TS	TRH C6-C40 - LTM-ORG-2010	Toluene	NA	NA	NA	90	Y	REG	
593556	593556	WATER	M18-Ap12245	TS	TRH C6-C40 - LTM-ORG-2010	Xylenes - Total	NA	NA	NA	91	Y	REG	
594882	594882	WATER	M18-Ap23276	TS	TRH C6-C40 - LTM-ORG-2010	Benzene	NA	NA	NA	110	Y	REG	
594882	594882	WATER	M18-Ap23276	TS	TRH C6-C40 - LTM-ORG-2010	Ethylbenzene	NA	NA	NA	98	Y	REG	
594882	594882	WATER	M18-Ap23276	TS	TRH C6-C40 - LTM-ORG-2010	m&p-Xylenes	NA	NA	NA	100	Y	REG	
594882	594882	WATER	M18-Ap23276	TS	TRH C6-C40 - LTM-ORG-2010	o-Xylene	NA	NA	NA	100	Y	REG	
594882	594882	WATER	M18-Ap23276	TS	TRH C6-C40 - LTM-ORG-2010	Toluene	NA	NA	NA	97	Y	REG	
594882	594882	WATER	M18-Ap23276	TS	TRH C6-C40 - LTM-ORG-2010	Xylenes - Total	NA	NA	NA	100	Y	REG	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Contents

Field Duplicates

Indoor Air Field Duplicates (WATER)

SDG	205744	205744	
Field ID	QA_AA1	140_SHOP	RPD
Sampled Da	15/11/2018	15/11/2018	

Chem_Group	ChemName	Units	EQL			
TO15	Propylene	ppbv	0.5	<0.5	<0.5	0
TO15	Dichlorodifluoromethane	ppbv	0.5	<0.5	<0.5	0
TO15	Chloromethane	ppbv	0.5	<0.5	<0.5	0
TO15	1,2-Dichlorotetrafluoroethane	ppbv	0.5	<0.5	<0.5	0
TO15	Vinyl Chloride	ppbv	0.5	<0.5	<0.5	0
TO15	1,3-Butadiene	ppbv	0.5	<0.5	<0.5	0
TO15	Bromomethane	ppbv	0.5	<0.5	<0.5	0
TO15	Chloroethane	ppbv	0.5	<0.5	<0.5	0
TO15	Ethanol	ppbv	0.5	51	53	4
TO15	Acrolein	ppbv	0.5	<0.5	<0.5	0
TO15	Trichlorofluoromethan (Freon 11)	ppbv	0.5	<0.5	<0.5	0
TO15	Acetone	ppbv	5	<5	<5	0
TO15	Isopropyl Alcohol	ppbv	0.5	0.6	0.5	0
TO15	1,1-Dichloroethene	ppbv	0.5	<0.5	<0.5	0
TO15	1,1,2-Trichlorotrifluorothane	ppbv	0.5	<0.5	<0.5	0
TO15	Methylene Chloride (Dichloromethane)	ppbv	0.5	<0.5	<0.5	0
TO15	Carbon Disulfide	ppbv	0.5	<0.5	<0.5	0
TO15	Trans-1,2-dichloroethene	ppbv	0.5	<0.5	<0.5	0
TO15	MTBE	ppbv	0.5	<0.5	<0.5	0
TO15	1,1-Dichloroethane	ppbv	0.5	<0.5	<0.5	0
TO15	Vinyl Acetate	ppbv	0.5	<0.5	<0.5	0
TO15	MEK	ppbv	0.5	<0.5	<0.5	0
TO15	Hexane	ppbv	0.5	<0.5	<0.5	0
TO15	Cis-1,2-Dichloroethene	ppbv	0.5	<0.5	<0.5	0
TO15	Ethyl Acetate	ppbv	0.5	1	1	0
TO15	Chloroform	ppbv	0.5	<0.5	<0.5	0
TO15	Tetrahydrofuran	ppbv	0.5	<0.5	<0.5	0
TO15	1,1,1-Trichlorethane	ppbv	0.5	<0.5	<0.5	0
TO15	1,2-Dichlorethane	ppbv	0.5	<0.5	<0.5	0
TO15	benzene	ppbv	0.5	<0.5	<0.5	0
TO15	Carbon Tetrachloride	ppbv	0.5	<0.5	<0.5	0
TO15	Cyclohexane	ppbv	0.5	<0.5	<0.5	0
TO15	Heptane	ppbv	0.5	<0.5	<0.5	0
TO15	Trichloroethene	ppbv	0.5	<0.5	<0.5	0
TO15	1,2-Dichloropropane	ppbv	0.5	<0.5	<0.5	0
TO15	1,4-Dioxane	ppbv	0.5	<0.5	<0.5	0
TO15	Bromodichloromethane	ppbv	0.5	<0.5	<0.5	0
TO15	Methyl Methacrylate	ppbv	0.5	<0.5	<0.5	0
TO15	MIBK	ppbv	0.5	<0.5	<0.5	0
TO15	cis-1,3-Dichloropropene	ppbv	0.5	<0.5	<0.5	0
TO15	trans-1,3-Dichloropropene	ppbv	0.5	<0.5	<0.5	0
TO15	Toluene	ppbv	0.5	0.7	0.7	0
TO15	1,1,2-Trichloroethane	ppbv	0.5	<0.5	<0.5	0
TO15	Methyl Butyl Ketone	ppbv	0.5	<0.5	<0.5	0
TO15	Dibromochloromethane	ppbv	0.5	<0.5	<0.5	0
TO15	Tetrachloroethene	ppbv	0.5	<0.5	<0.5	0
TO15	1,2-Dibromoethane	ppbv	0.5	<0.5	<0.5	0
TO15	Chlorobenzene	ppbv	0.5	<0.5	<0.5	0
TO15	Ethylbenzene	ppbv	0.5	<0.5	<0.5	0
TO15	m-& p-Xylene	ppbv	0.5	<1	<1	0
TO15	Styrene	ppbv	0.5	<0.5	<0.5	0
TO15	o-Xylene	ppbv	0.5	<0.5	<0.5	0
TO15	Bromoform	ppbv	0.5	<0.5	<0.5	0
TO15	1,1,2,2-Tetrachloroethane	ppbv	0.5	<0.5	<0.5	0
TO15	4-ethyl toluene	ppbv	0.5	<0.5	<0.5	0
TO15	1,3,5-Trimethylbenzene	ppbv	0.5	<0.5	<0.5	0
TO15	1,2,4-Trimethylbenzene	ppbv	0.5	<0.5	<0.5	0
TO15	1,3-Dichlorobenzene	ppbv	0.5	<0.5	<0.5	0
TO15	Benzyl chloride	ppbv	0.5	<0.5	<0.5	0
TO15	1,4-Dichlorobenzene	ppbv	0.5	<0.5	<0.5	0
TO15	1,2-Dichlorobenzene	ppbv	0.5	<0.5	<0.5	0
TO15	1,2,4-Trichlorobenzene	ppbv	0.5	<0.5	<0.5	0
TO15	Naphthalene	ppbv	0.5	<0.5	<0.5	0
TO15	Hexachloro- 1,3-butadiene	ppbv	0.5	<0.5	<0.5	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.

**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 30 (1-10 x EQL); 30 (10-30 x EQL); 30 (> 30 x EQL))

***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary l

aborator

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix J Field Groundwater and Soil Vapour Monitoring Sheets

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Groundwater Sampling Form
FIELD RECORD SHEETS

JBS&G

Project name: Perth	**Location:** Funeral Parlour	**Well ID:** JBMW01	
Project number: 52372			
Person sampling: RH & CB	**Sampling Date:** 16-4-18	**Weather:** Fine	

Casing Diameter (mm):		**Depth to NAPL (mBTOC):**	—
Well Completion:	Flush Mount / Monument	**Depth to SWL (mBTOC):**	7.500
Well Cap Type:	Locking Cap / PVC / Other	**NAPL Thickness (m):**	—
Well Condition:	Good / Compromised (see notes)	**Depth to EoH (mbtoc):**	11.950
Calculated Well Volume (L):		**Water Column Depth (m):**	4.450
Sampling Method:	Purge Volume: 4 Casings Vol. (L):	**NAPL Visually Verified?**	—
	Low Flow: Pump Submersion depth (mBTOC):		

Time	Volume Purged	Dissolved Oxygen	Temp.	pH	EC	ORP	Comments
	L	% ☐ mgL/ppm ☒	°C	pH units	S/cm	mV	Include SWL for low flow (mBTOC)
10:07	0.0	4.08	24.0	7.10	9839	86.4	
10:09	0.5	2.29	22.6	7.05	9556	1.3	7.400
10:11	1.0	1.20	22.2	6.92	9959	-37.7	[redacted]
10:13	1.25	0.65	22.1	6.85	9979	-64.0	7.490
10:15	1.50	0.81	21.9	6.78	10012	-75.9	
10:18	2.00	0.30	21.7	6.72	10012	-87.6	7.60
10:20	3.00	0.65	21.8	6.69	9973	-94.4	
10:22	3.25	0.16	21.8	6.63	10192	-106.4	
10:26	4.00	0.19	21.7	6.62	10177	-111.7	7.79.
10:28	4.25	0.19	22.3	6.59	10292	-121.2	
10:30	4.50	0.20	22.4	6.59	10329	-123.3	
10:32	4.75	0.73	22.7	6.57	10385	-125.5	
Acceptable Variation*		+/-10%	+/- 0.2 °C	+/-0.1 pH	+/-5%	+/-10mV	**Results Acceptable: YES / NO**

LOW FLOW: Typical flow rate = 0.2- 0.4 L/min - Max. drawdown = 0.1 m - Well stable when 3 consecutive readings (either 3min apart or 1L apart)

PURGE: Min. sampling volume is 4 casing volumes or dry twice - 1 casing volume (50mm wells) = 2 L/m - 1 casing volume (100mm wells) = 8 L/m

Clarity:	Turbid.	**Sheen:**	YES / (NO)
Colour:	brown / orange	**Odour:**	YES / (NO)

Primary sample ID:	JBMW01		**No.**	**Container / Preservative**
★ **Duplicate sample:**	(YES) / NO	ID: QC20180416	4 X	HCl vial
Triplicate sample:	(YES) / NO	ID: QA 20180416	4 x	HCl vial
Rinsate sample:	(YES) / NO	ID: RINS		
Sample on ice:	(YES) / NO			
Field Filter Method:	0.45µm Filter / (Not Filtered)			
Water Quality Meter:	YSI			
Guaging Equipment:	IP			
Pump Type:	Bladder.			

Notes: Final dip = 7.58m (Quick recharge) (3)

Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)

Casing Diameter	25mm	50mm	100mm	150mm	300mm
Conversion Factor	0.98	1.96	7.85	49.1	196.3

Volume of water in well (L) = π * radius of gravel pack (m)^2 * height of water column (m)

*SA EPA Guidelines (June 2007) as referenced in NEPM

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Groundwater Sampling Form
FIELD RECORD SHEETS

JBS&G

Project name:	Penrith	**Location:** Henry St	**Well ID:** TBMW02
Project number:	34017		
Person sampling:	RH	**Sampling Date:** 16-4-18	**Weather:** Fine

Casing Diameter (mm):		**Depth to NAPL (mBTOC):**	—
Well Completion:	Flush Mount / Monument	**Depth to SWL (mBTOC):**	7.065
Well Cap Type:	Locking Cap / PVC / Other	**NAPL Thickness (m):**	—
Well Condition:	Good / Compromised (see notes)	**Depth to EoH (mbtoc):**	10.950
Calculated Well Volume (L):		**Water Column Depth (m):**	3.885
Sampling Method:	Purge Volume: 4 Casings Vol. (L):	**NAPL Visually Verified?**	—
	Low Flow: Pump Submersion depth (mBTOC):		

Time	Volume Purged	Dissolved Oxygen	Temp.	pH	EC	ORP	Comments
	L	% ☐ mgL/ppm ☒	°C	pH units	µS/cm	mV	include SWL for low flow (mBTOC)
900	0	2.97	22.4	2.17	7894	108.0	
902	1	2.26	21.9	6.97	7875	41.0	
904	1.25	2.30	21.9	6.88	7850	12.3	7.520
906	1.5	2.28	21.9	6.87	7855	0.3	
908	1.75	2.46	21.9	6.85	7859	-11.6	8.030
911	2.0	2.27	22.0	6.82	7904	-35.8	
914	2.0	2.43	22.1	6.81	7924	-50.9	
		Sampled @ 914	ORP did not stabilize				
945	2.5	1.13	22.8	6.81	8075	-35.9	
Acceptable Variation*		+/-10%	+/- 0.2 °C	+/-0.1 pH	+/-5%	+/-10mV	**Results Acceptable: YES / NO**

LOW FLOW: Typical flow rate = 0.2- 0.4 L/min - Max. drawdown = 0.1 m - Well stable when 3 consecutive readings (either 3min apart or 1L apart)

PURGE: Min. sampling volume is 4 casing volumes or dry twice - 1 casing volume (50mm wells) = 2 L/m - 1 casing volume (100mm wells) = 8 L/m

Clarity:	Turbid	**Sheen:**	YES / (NO)
Colour:	Orange-brown	**Odour:**	YES / (NO)

			No.	Container / Preservative
Primary sample ID:	TMW02		4x	HCl 40mL
Duplicate sample:	YES / (NO)	ID:		
Triplicate sample:	YES / (NO)	ID:		
Rinsate sample:	(YES) / NO	ID: RIPS		
Sample on ice:	(YES) / NO			
Field Filter Method:	0.45µm Filter / Not Filtered			
Water Quality Meter:	YSI			
Guaging Equipment:	IP			
Pump Type:	Bladder			

Notes: Bladder pump unable to reach bottom of well, potential well deformation during install, bladder suspended @ 9.0m Low recharge

Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)

Casing Diameter	25mm	50mm	100mm	150mm	300mm
Conversion Factor	0.98	1.96	7.85	49.1	196.3

Volume of water in well (L) = π * radius of gravel pack (m)^2 * height of water column (m)

*SA EPA Guidelines (June 2007) as referenced in NEPM

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Groundwater Sampling Form
FIELD RECORD SHEETS

JBS&G

Project name:	Penrith	**Location:** JBMW03	**Well ID:** Petrol station
Project number:	52372		
Person sampling:	RM + CB	**Sampling Date:** 16.4.18	**Weather:** Fine.

Casing Diameter (mm):	50	**Depth to NAPL (mBTOC):**	-
Well Completion:	Flush Mount / Monument	**Depth to SWL (mBTOC):**	7.33
Well Cap Type:	Locking Cap / PVC / Other	**NAPL Thickness (m):**	-
Well Condition:	Good / Compromised (see notes)	**Depth to EoH (mbtoc):**	12.07
Calculated Well Volume (L):	50	**Water Column Depth (m):**	~~12.07~~ 4.74
Sampling Method:	Purge Volume: 4 Casings Vol. (L):	**NAPL Visually Verified?**	
	Low Flow: Pump Submersion depth (mBTOC):		

Time	Volume Purged	Dissolved Oxygen	Temp.	pH	EC	ORP	Comments
	L	% ☐ mgL/ppm ☒	°C	pH units	µS/cm	mV	include SWL for low flow (mBTOC)
1448	0	3.55	27.0	7.13	11274	70.8	
1450	0.75	1.15	25.5	7.00	11377	1.00	
1452	1.5	0.93	24.1	6.82	11329	-34.9	7.64
1454	2.0	0.74	23.0	6.49	11187	-55.7	
1456	3.5	0.79	23.0	6.46	11124	-63.7	
1458	3.0	0.74	23.1	6.46	11061	-76.1	8.41
1500	3.5	0.74	23.0	6.48	10933	-89.9	
1502	4.0	0.79	23.0	6.49	10833	-105.9	
1504	4.5	0.76	22.9	6.51	10799	-113.4	8.61
		Sampled @ 4.5L / 16 minutes - stable parameters					
Acceptable Variation*		+/-10%	+/- 0.2 °C	+/-0.1 pH	+/-5%	+/-10mV	**Results Acceptable: YES / NO**

LOW FLOW: Typical flow rate = 0.2- 0.4 L/min - Max. drawdown = 0.1 m - Well stable when 3 consecutive readings (either 3min apart or 1L apart)

PURGE: Min. sampling volume is 4 casing volumes or dry twice - 1 casing volume (50mm wells) = 2 L/m - 1 casing volume (100mm wells) = 8 L/m

Clarity:	Moderately Turbid	**Sheen:**	YES / (NO)
Colour:	Orange & Brown	**Odour:**	YES / (NO)

Primary sample ID:	JBMW03	**No.**	**Container / Preservative**
Duplicate sample:	(YES) / NO ID: QC20180416-1	4x	HCL 40mL
Triplicate sample:	(YES) / NO ID: QA20180416-1	1x	1L Amber
Rinsate sample:	(YES) / NO ID: RINS	1x	100mL Nitric Acid
Sample on ice:	(YES) / NO		
Field Filter Method:	0.45µm Filter / Not Filtered		
Water Quality Meter:	YSI		
Guaging Equipment:	IP		
Pump Type:	Bladder		

Notes: QC for Amber & Metals

Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)

Casing Diameter	25mm	50mm	100mm	150mm	300mm
Conversion Factor	0.98	1.96	7.85	49.1	196.3

Volume of water in well (L) = π * radius of gravel pack $(m)^2$ * height of water column (m)

*SA EPA Guidelines (June 2007) as referenced in NEPM

IMSO Forms010 – Rev2

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Groundwater Sampling Form
FIELD RECORD SHEETS

JBS&G

Project name: 52372	**Location:** JBMW04 **Well ID:** Rear of 144
Project number: Penrith	
Person sampling: RH + CB	**Sampling Date:** 16/4/18 **Weather:** Fine

Casing Diameter (mm): 50	**Depth to NAPL (mBTOC):** —
Well Completion: (Flush Mount) / Monument	**Depth to SWL (mBTOC):** 7.14m
Well Cap Type: (Locking Cap) / PVC / Other	**NAPL Thickness (m):** —
Well Condition: (Good) / Compromised (see notes)	**Depth to EoH (mbtoc):** 4.42
Calculated Well Volume (L):	**Water Column Depth (m):** 11.56m
Sampling Method: Purge Volume: 4 Casings Vol. (L):	**NAPL Visually Verified?** —
Low Flow: Pump Submersion depth (mBTOC):	

Time	Volume Purged	Dissolved Oxygen	Temp.	pH	EC	ORP	Comments
	L	% ☐ mgL/ppm ☒	°C	pH units	µS/cm	mV	include SWL for low flow (mBTOC)
14:07	0	2.65	25.3	7.47	11206	111.7	7.14
14:09	0.5	0.71	24.0	7.21	10983	13.7	7.31
14:11	0.9	0.34	23.3	7.05	10869	-40.8	7.48
14:13	1.2	0.50	23.3	6.97	10859	-59.8	7.65
14:15	1.6	0.62	23.3	6.92	10807	-71.2	7.84
14:17	2.0	0.61	23.3	6.91	10779	-75.4	7.99
14:19	2.4	0.61	23.2	6.89	10721	-81.8	8.17
		Sampled @ 2.4L / 12 minutes					parameters stable
Acceptable Variation*		+/-10%	+/- 0.2 °C	+/-0.1 pH	+/-5%	+/-10mV	**Results Acceptable: YES / NO**

LOW FLOW: Typical flow rate = 0.2- 0.4 L/min - Max. drawdown = 0.1 m - Well stable when 3 consecutive readings (either 3min apart or 1L apart)

PURGE: Min. sampling volume is 4 casing volumes or dry twice - 1 casing volume (50mm wells) = 2 L/m - 1 casing volume (100mm wells) = 8 L/m

Clarity:	Mildly turbid - low turbid	**Sheen:**	YES / (NO)
Colour:	Light brown	**Odour:**	YES / (NO)

		No.	Container / Preservative
Primary sample ID:	BJBMW04	4x	HCl 40mL
Duplicate sample:	YES / (NO) ID:	1x	250mL Amber
Triplicate sample:	YES / (NO) ID:		
Rinsate sample:	(YES) / NO ID: RINS		
Sample on ice:	YES / (NO)		
Field Filter Method:	0.45µm Filter / (Not Filtered)		
Water Quality Meter:	YSI		
Guaging Equipment:	IP		
Pump Type:	Bladder		

Notes:

Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)

Casing Diameter	25mm	50mm	100mm	150mm	300mm
Conversion Factor	0.98	1.96	7.85	49.1	196.3

Volume of water in well (L) = π * radius of gravel pack $(m)^2$ * height of water column (m)

*SA EPA Guidelines (June 2007) as referenced in NEPM

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Groundwater Sampling Form
FIELD RECORD SHEETS

JBS&G

Project name: Penrith	**Location:** Dry Cleaner Carpark	**Well ID:** PSMO1	
Project number: 52377			
Person sampling: RH	**Sampling Date:** 16-4-18	**Weather:** Fine	

Casing Diameter (mm): 50		**Depth to NAPL (mBTOC):** —	
Well Completion:	Flush Mount / Monument	**Depth to SWL (mBTOC):** 7.190 m.	
Well Cap Type:	Locking Cap / PVC / Other	**NAPL Thickness (m):** —	
Well Condition:	Good / Compromised (see notes)	**Depth to EoH (mbtoc):** 12.080m	
Calculated Well Volume (L):		**Water Column Depth (m):** 4.890	
Sampling Method:	Purge Volume: 4 Casings Vol. (L):	**NAPL Visually Verified?** —	
	Low Flow: Pump Submersion depth (mBTOC):		

Time	Volume Purged	Dissolved Oxygen	Temp.	pH	EC	ORP	Comments
	L	% / mgL/ppm ☐ ☐	°C	pH units	µS/cm	mV	include SWL for low flow (mBTOC)
11:07	0	2.31	24.1	6.98	9264	-27.1	
11:10	1.2	0.33	22.1	6.78	8896	-2.3	
11:12	1.50	0.41	22.2	6.65	8867	4.7	7.64m
11:14	1.80	0.44	22.2	6.55	8840	12.9	
11:16	2.00	0.39	22.1	6.47	8812	20.8	
11:20	2.2	0.45	22.1	6.38	8829	29.9	7.96
11:22	2.8	0.63	22.3	6.29	8862	34.6	
11:26	3.0	0.69	22.4	6.25	8900	35.0	7.93
		Sampled @ 9x 19 minutes / 3L parameters stable					
Acceptable Variation*		+/-10%	+/- 0.2 °C	+/-0.1 pH	+/-5%	+/-10mV	**Results Acceptable: YES / NO**

LOW FLOW: Typical flow rate = 0.2- 0.4 L/min - Max. drawdown = 0.1 m - Well stable when 3 consecutive readings (either 3min apart or 1L apart)

PURGE: Min. sampling volume is 4 casing volumes or dry twice - 1 casing volume (50mm wells) = 2 L/m - 1 casing volume (100mm wells) = 8 L/m

Clarity:	Mildly turbid	**Sheen:**	YES / NO
Colour:	Dark grey	**Odour:**	YES / NO

				No.	Container / Preservative
Primary sample ID:	PSMO1			4X	HCl 40ml
Duplicate sample:	YES / NO	ID:		1X	250mL Amber
Triplicate sample:	YES / NO	ID:			
Rinsate sample:	YES / NO	ID:	RINS		
Sample on ice:	YES / NO				
Field Filter Method:	0.45µm Filter / Not Filtered				
Water Quality Meter:	YSI				
Guaging Equipment:	IP				
Pump Type:	Bladder				

Notes:

Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)

Casing Diameter	25mm	50mm	100mm	150mm	300mm
Conversion Factor	0.98	1.96	7.85	49.1	196.3

Volume of water in well (L) = Π * radius of gravel pack (m)^2 * height of water column (m)

*SA EPA Guidelines (June 2007) as referenced in NEPM

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Groundwater Sampling Form
FIELD RECORD SHEETS

JBS&G

Project name:	Penrith	**Location:** Allen PL Carpark	**Well ID:** ASMO2
Project number:	52372		
Person sampling:	RH	**Sampling Date:** 16/4/18	**Weather:** Fine

Casing Diameter (mm):	50	**Depth to NAPL (mBTOC):**	—
Well Completion:	Flush Mount / Monument	**Depth to SWL (mBTOC):**	7.80
Well Cap Type:	Locking Cap / PVC / Other	**NAPL Thickness (m):**	—
Well Condition:	Good / Compromised (see notes)	**Depth to EoH (mbtoc):**	11.920
Calculated Well Volume (L):		**Water Column Depth (m):**	4.12
Sampling Method:	Purge Volume: 4 Casings Vol. (L):	**NAPL Visually Verified?**	✓
	Low Flow: Pump Submersion depth (mBTOC):		

Time	Volume Purged	Dissolved Oxygen	Temp.	pH	EC	ORP	Comments
	L	% / mg/L/ppm	°C	pH units	µS/cm	mV	Include SWL for low flow (mBTOC)
12:18	0.0	7.10	28.7	7.31	10091	+25.0	
12:20	0.25	0.96	24.8	6.78	9060	-103.9	
12:22	0.5	0.37	24.2	6.80	10368	-117.6	7.84
12:25	0.8	0.32	24.4	6.83	10583	-126.7	
12:27	1.0	0.23	23.9	6.85	10593	-127.5	
		Sampled @ 10L - pumped for 9 minutes					
Acceptable Variation*		+/-10%	+/- 0.2 °C	+/-0.1 pH	+/-5%	+/-10mV	Results Acceptable: YES / NO

LOW FLOW: Typical flow rate = 0.2- 0.4 L/min - Max. drawdown = 0.1 m - Well stable when 3 consecutive readings (either 3min apart or 1L apart)

PURGE: Min. sampling volume is 4 casing volumes or dry twice - 1 casing volume (50mm wells) = 2 L/m - 1 casing volume (100mm wells) = 8 L/m

Clarity:	Mildly turbid	**Sheen:**	YES / (NO)
Colour:	Dark Grey	**Odour:**	(YES) / NO Sulfurous

			No.	Container / Preservative
Primary sample ID:	ASMO2		1x	HCl 40mL
Duplicate sample:	YES / (NO)	ID:	1x	250mL Amber
Triplicate sample:	YES / (NO)	ID:		
Rinsate sample:	(YES) / NO	ID: RINS		
Sample on ice:	(YES) / NO			
Field Filter Method:	0.45µm Filter / Not Filtered			
Water Quality Meter:	YSI			
Guaging Equipment:	IP			
Pump Type:	Bladder			

Notes:

Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)

Casing Diameter	25mm	50mm	100mm	150mm	300mm
Conversion Factor	0.98	1.96	7.85	49.1	196.3

Volume of water in well (L) = π * radius of gravel pack (m)² * height of water column (m)

*SA EPA Guidelines (June 2007) as referenced in NEPM

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Groundwater Sampling Form
FIELD RECORD SHEETS

JBS&G

Project name:	Penrith	**Location:**	Allen Ca-Park Dunn East
Project number:	52372	**Well ID:**	PSMW3
Person sampling:	AH & CB	**Sampling Date:**	16-4-19
		Weather:	Fine

Casing Diameter (mm):	50	**Depth to NAPL (mBTOC):**	-
Well Completion:	Flush Mount / Monument	**Depth to SWL (mBTOC):**	8.31
Well Cap Type:	Locking Cap / PVC / Other	**NAPL Thickness (m):**	-
Well Condition:	Good / Compromised (see notes)	**Depth to EoH (mbtoc):**	12.22
Calculated Well Volume (L):		**Water Column Depth (m):**	3.91
Sampling Method:	Purge Volume: 4 Casings Vol. (L):	**NAPL Visually Verified?**	-
	Low Flow: Pump Submersion depth (mBTOC):		

Time	Volume Purged	Dissolved Oxygen	Temp.	pH	EC	ORP	Comments
	L	% ☐ mgL/ppm ☑	°C	pH units	S/cm	mV	include SWL for low flow (mBTOC)
1:48	0	0.85	25.8	7.58	4421	119.8	
		distruction encountered in well which preluded lowering submersible pump beyond 4m mbtoc					
		Grab Sample collected with foctrolve & Style parameter reading collected					
Acceptable Variation*		+/-10%	+/- 0.2 °C	+/-0.1 pH	+/-5%	+/-10mV	**Results Acceptable: YES / NO**

LOW FLOW: Typical flow rate = 0.2- 0.4 L/min - Max. drawdown = 0.1 m - Well stable when 3 consecutive readings (either 3min apart or 1L apart)

PURGE: Min. sampling volume is 4 casing volumes or dry twice - 1 casing volume (50mm wells) = 2 L/m - 1 casing volume (100mm wells) = 8 L/m

Clarity:	Clear - mildly turbid	**Sheen:**	YES / NO
Colour:	yellow	**Odour:**	YES / NO

Primary sample ID:	AH PSMW3		**No.**	**Container / Preservative**
Duplicate sample:	YES / NO	ID:	4x	HCL 40mL
Triplicate sample:	YES / NO	ID:	1x	250 mL Amber
Rinsate sample:	YES / NO	ID: RINS		
Sample on ice:	YES / NO			
Field Filter Method:	0.45µm Filter / Not Filtered			
Water Quality Meter:	YSI			
Guaging Equipment:	IP			
Pump Type:	Foctrolve			

Notes:

Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)

Casing Diameter	25mm	50mm	100mm	150mm	300mm
Conversion Factor	0.98	1.96	7.85	49.1	196.3

Volume of water in well (L) = π * radius of gravel pack $(m)^2$ * height of water column (m)

*SA EPA Guidelines (June 2007) as referenced in NEPM

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Groundwater Sampling Form
FIELD RECORD SHEETS

JBS&G

Project name: Penrith	**Location:** South side Henry St	**Well ID:** JBMW02
Project number: 55073		
Person sampling: CB	**Sampling Date:** 15.11.18	**Weather:** Fine Sunny

Casing Diameter (mm):		**Depth to NAPL (mBTOC):**
Well Completion:	Flush Mount / Monument	**Depth to SWL (mBTOC):** 7.181
Well Cap Type:	Locking Cap / PVC / Other	**NAPL Thickness (m):**
Well Condition:	Good / Compromised (see notes)	**Depth to EoH (mbtoc):** 10.550
Calculated Well Volume (L):		**Water Column Depth (m):**
Sampling Method:	Purge Volume: 4 Casings Vol. (L):	**NAPL Visually Verified?**
	Low Flow: Pump Submersion depth (mBTOC):	

Time	Volume Purged	Dissolved Oxygen	Temp.	pH	EC	ORP	Comments
	L	% mgL/ppm ☐ ☑	°C	pH units	S/cm	mV	include SWL for low flow (mBTOC)
7.15	0.5	2.36	21.1	8.69	3349	14.8	
	1.0	1.20	21.2	7.86	3298	-116.8	
7.24	1.5	0.98	21.2	7.75	3376	-128.1	7.486.
	1.8	0.58	21.2	7.42	4606	-154.8	
	2.0	0.43	21.1	7.28	5792	-163.0	7.399
7.36	2.2	0.50	21.1	7.21	6750	-162.9	
	2.5	0.48	21.2	7.20	6692	-163.5	
	3.0	0.67	21.1	7.14	5824	-155.3	
	3.5	0.76	21.2	7.01	5838	-149.1	
	3.8	0.75	21.2	6.98	5995	-144.7	
	4.0	0.76	21.2	6.98	6071	-147.3	
7.59	4.3	0.75	21.2	6.99	6079	-147.1	7.419 (sampled)
Acceptable Variation*		+/-10%	+/- 0.2 °C	+/-0.1 pH	+/-5%	+/-10mV	**Results Acceptable:** (YES) / NO

LOW FLOW: Typical flow rate = 0.2- 0.4 L/min - Max. drawdown = 0.1 m - Well stable when 3 consecutive readings (either 3min apart or 1L apart)

PURGE: Min. sampling volume is 4 casing volumes or dry twice - 1 casing volume (50mm wells) = 2 L/m - 1 casing volume (100mm wells) = 8 L/m

Clarity:	clear / Non turbid	**Sheen:**	YES / (NO)
Colour:	clear	**Odour:**	YES / (NO)

		No.	Container / Preservative
Primary sample ID:	JBMW02		
Duplicate sample:	YES / (NO) ID:		
Triplicate sample:	YES / (NO) ID:		
Rinsate sample:	(YES) / NO ID:		
Sample on ice:	(YES) NO		
Field Filter Method:	0.45µm Filter / Not Filtered		
Water Quality Meter:	YSI		
Guaging Equipment:	IP		
Pump Type:	Bladder pump		

Notes:

Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)

Casing Diameter	25mm	50mm	100mm	150mm	300mm
Conversion Factor	0.98	1.96	7.85	49.1	196.3

Volume of water in well (L) = π * radius of gravel pack $(m)^2$ * height of water column (m)

*SA EPA Guidelines (June 2007) as referenced in NEPM

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Groundwater Sampling Form
FIELD RECORD SHEETS

JBS&G

Project name: Penrith	**Location:**	**Well ID:**
Project number: 55073	Nth Henry St	JBMW05
Person sampling: CB	**Sampling Date:** 15.11.18	**Weather:** Fine

Casing Diameter (mm):	50mm	**Depth to NAPL (mBTOC):**	
Well Completion:	Flush Mount / Monument	**Depth to SWL (mBTOC):**	7.167
Well Cap Type:	Locking Cap / PVC / Other	**NAPL Thickness (m):**	
Well Condition:	Good / Compromised (see notes)	**Depth to EoH (mbtoc):**	
Calculated Well Volume (L):		**Water Column Depth (m):**	
Sampling Method:	Purge Volume: 4 Casings Vol. (L):	**NAPL Visually Verified?**	
	Low Flow: Pump Submersion depth (mBTOC):		

Time	Volume Purged	Dissolved Oxygen	Temp.	pH	EC	ORP	Comments
	L	% mg/L ppm	°C	pH units	µS/cm	mV	include SWL for low flow (mBTOC)
10.00	0.5	0.86	23.2	7.05	8867	48.3	
	1.0	0.73	22.3	6.73	8268	20.6	
	1.3	0.80	22.5	6.68	8245	-24.0	7.302
10:17	2.0	1.26	22.4	6.57	8781	-29.8	
10:24	2.5	1.29	22.5	6.54	8731	-34.3	
	3.0	1.29	22.4	6.53	8710	-37.6	
	3.3	1.30	22.4	6.52	8709	-38.7	
10:41	3.5	1.30	22.4	6.53	8707	-39.1	7.498 (sampled)
Acceptable Variation*		+/-10%	+/- 0.2 °C	+/-0.1 pH	+/-5%	+/-10mV	**Results Acceptable: YES / NO**

LOW FLOW: Typical flow rate = 0.2- 0.4 L/min - Max. drawdown = 0.1 m - Well stable when 3 consecutive readings (either 3min apart or 1L apart)

PURGE: Min. sampling volume is 4 casing volumes or dry twice - 1 casing volume (50mm wells) = 2 L/m - 1 casing volume (100mm wells) = 8 L/m

Clarity:	Turbid	**Sheen:**	YES / NO
Colour:	Orange / brown	**Odour:**	YES / NO

		No.	Container / Preservative
Primary sample ID:	JBMW05		
Duplicate sample:	YES / NO ID:		
Triplicate sample:	YES / NO ID:		
Rinsate sample:	YES / NO ID:		
Sample on ice:	YES / NO		
Field Filter Method:	0.45µm Filter / Not Filtered		
Water Quality Meter:	YSI		
Guaging Equipment:	IP		
Pump Type:	Bladder pump.		

Notes:

Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)

Casing Diameter	25mm	50mm	100mm	150mm	300mm
Conversion Factor	0.98	1.96	7.85	49.1	196.3

Volume of water in well (L) = π * radius of gravel pack $(m)^2$ * height of water column (m)

*SA EPA Guidelines (June 2007) as referenced in NEPM

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Groundwater Sampling Form
FIELD RECORD SHEETS

JBS&G

Project name: Penrith	**Location:** Nth Allen Place Car Park	**Well ID:** PSM01	
Project number: 55073			
Person sampling: CB	**Sampling Date:** 15.11.18	**Weather:** Fine/Stormy	

Casing Diameter (mm): 50		**Depth to NAPL (mBTOC):**	
Well Completion: (Flush Mount) / Monument		**Depth to SWL (mBTOC):** 7.259	
Well Cap Type: (Locking) Cap / PVC / Other		**NAPL Thickness (m):**	
Well Condition: (Good) / Compromised (see notes)		**Depth to EoH (mbtoc):** 12.069	
Calculated Well Volume (L):		**Water Column Depth (m):**	
Sampling Method: Purge Volume: 4 Casings Vol. (L):		**NAPL Visually Verified?**	
Low Flow: Pump Submersion depth (mBTOC):			

Time	Volume Purged	Dissolved Oxygen	Temp.	pH	EC	ORP	Comments
	L	% mgL/(ppm) ☐ ☑	°C	pH units	µS/cm	mV	include SWL for low flow (mBTOC)
12:20	0.2	0.36	22.4	7.0	5335	-71.8	
	0.5	0.38	22.3	6.72	5847	-69.3	
	1.0	0.76	20.7	6.65	5631	-69.3	
12:31	1.3	1.14	20.6	6.51	5897	-68.2	7.449
	1.5	1.12	20.2	6.50	5381	-41.4	
	2.0	1.18	21.9	6.48	5407	-37.1	
	2.2	1.24	21.9	6.43	5899	-24.8	
	2.5	1.30	21.9	6.43	5898	-23.1	
	3.0	1.31	21.9	6.42	5934	-21.5	
	3.5	1.33	21.9	6.41	5989	-19.4	
	3.8	1.32	21.9	6.40	5968	-19.1	
12:59	4.0	1.33	21.9	6.39	5969	-18.9	7.561 (sampled)
Acceptable Variation*		+/-10%	+/- 0.2 °C	+/-0.1 pH	+/-5%	+/-10mV	**Results Acceptable:** (YES) / NO

LOW FLOW: Typical flow rate = 0.2- 0.4 L/min - Max. drawdown = 0.1 m - Well stable when 3 consecutive readings (either 3min apart or 1L apart)

PURGE: Min. sampling volume is 4 casing volumes or dry twice - 1 casing volume (50mm wells) = 2 L/m - 1 casing volume (100mm wells) = 8 L/m

Clarity:	Turbid	**Sheen:**	YES / (NO)
Colour:	Grey	**Odour:**	YES / (NO)

		No.	Container / Preservative
Primary sample ID:	PSM01		
Duplicate sample:	(YES) / NO ID: QA151118		
Triplicate sample:	(YES) / NO ID: QC151118		
Rinsate sample:	(YES) / NO ID:		
Sample on Ice:	(YES) / NO		
Field Filter Method:	0.45µm Filter / Not Filtered		
Water Quality Meter:	YSI		
Guaging Equipment:	IP		
Pump Type:	Bladder Pump.		

Notes:

Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)

Casing Diameter	25mm	50mm	100mm	150mm	300mm
Conversion Factor	0.98	1.96	7.85	49.1	196.3

Volume of water in well (L) = π * radius of gravel pack (m)^2 * height of water column (m)

*SA EPA Guidelines (June 2007) as referenced in NEPM

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Groundwater Sampling Form
FIELD RECORD SHEETS

JBS&G

Project name:	Penrith	**Location:** 48 Belmore St	**Well ID:** JBMW06
Project number:	55073		
Person sampling:	CB	**Sampling Date:** 21/11/18	**Weather:** cloudy

Casing Diameter (mm):	50mm	**Depth to NAPL (mBTOC):**	
Well Completion:	(Flush Mount) / Monument	**Depth to SWL (mBTOC):**	7.06
Well Cap Type:	(Locking Cap) / PVC / Other	**NAPL Thickness (m):**	
Well Condition:	(Good) / Compromised (see notes)	**Depth to EoH (mbtoc):**	10.05
Calculated Well Volume (L):		**Water Column Depth (m):**	
Sampling Method:	Purge Volume: 4 Casings Vol. (L):	**NAPL Visually Verified?**	
	Low Flow: Pump Submersion depth (mBTOC):		

Time	Volume Purged	Dissolved Oxygen	Temp.	pH	EC	ORP	Comments
	L	% / mgL/ppm ☐/☑	°C	pH units	µS/cm	mV	include SWL for low flow (mBTOC)
08:23	0.5	0.99	22.0	7.06	6139	145.4	silty brown / high turbidity
	1.5	1.46	22.9	6.33	6233	76.0	
	2.0	1.80	23.2	6.21	6257	56.3	7.759 DTW
8:46	2.3	1.25	24.1	6.27	6383	64.4	
	2.5	2.19	22.5	6.05	6197	51.5	
	2.8	2.31	22.5	6.01	6198	48.2	
8:58	3.0	2.30	22.3	6.02	6158	35.4	9.589 DTW
		2.30	22.3	6.01	6151	30.3	9.119 DTW
Acceptable Variation*		+/-10%	+/- 0.2 °C	+/-0.1 pH	+/-5%	+/-10mV	**Results Acceptable: YES / NO**

LOW FLOW: Typical flow rate = 0.2- 0.4 L/min - Max. drawdown = 0.1 m - Well stable when 3 consecutive readings (either 3min apart or 1L apart)

PURGE: Min. sampling volume is 4 casing volumes or dry twice - 1 casing volume (50mm wells) = 2 L/m - 1 casing volume (100mm wells) = 8 L/m

Clarity:	very turbid	**Sheen:**	YES / (NO)
Colour:	orangy brown	**Odour:**	YES / (NO)

Primary sample ID:		**No.**	**Container / Preservative**
Duplicate sample:	YES / (NO) ID:		4x vials
Triplicate sample:	YES / (NO) ID:		
Rinsate sample:	(YES) / NO ID:		
Sample on ice:	(YES) / NO		
Field Filter Method:	0.45µm Filter / (Not Filtered)		
Water Quality Meter:	YSI		
Guaging Equipment:	IP		
Pump Type:	bladder		

Notes:

Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)

Casing Diameter	25mm	50mm	100mm	150mm	300mm
Conversion Factor	0.98	1.96	7.85	49.1	196.3

Volume of water in well (L) = π * radius of gravel pack $(m)^2$ * height of water column (m)

*SA EPA Guidelines (June 2007) as referenced in NEPM

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Groundwater Sampling Form
FIELD RECORD SHEETS

Project name: Penrith	**Location:**	**Well ID:**	
Project number: 55073	48 Belmore St	JBMW07	
Person sampling: CB	**Sampling Date:** 21/11/18	**Weather:**	

Casing Diameter (mm):		**Depth to NAPL (mBTOC):**	
Well Completion:	Flush Mount / Monument	**Depth to SWL (mBTOC):**	7.275
Well Cap Type:	Locking Cap / PVC / Other	**NAPL Thickness (m):**	
Well Condition:	Good / Compromised (see notes)	**Depth to EoH (mbtoc):**	9.921
Calculated Well Volume (L):		**Water Column Depth (m):**	
Sampling Method:	Purge Volume: 4 Casings Vol. (L):	**NAPL Visually Verified?**	
	Low Flow: Pump Submersion depth (mBTOC):		

Time	Volume Purged	Dissolved Oxygen	Temp.	pH	EC	ORP	Comments
	L	% ☐ mgL/ppm ☑	°C	pH units	µS/cm	mV	include SWL for low flow (mBTOC)
9.10	0.5	0.90	23.5	6.92	7439	12.20	silty dark brown/ very turbid
	1.0	0.60	24.2	6.88	7538	-23.80	
	1.5	1.08	24.8	6.86	7712	-33.3	
	2.0	1.10	24.5	6.82	7676	-37.6	
9.42	2.5	1.09	24.7	6.76	7698	-41.1	7.880
		1.02	24.8	6.75	7618	-52.2	
		1.10	24.8	6.78	7520	-59.8	
		1.07	24.7	6.67	7531	-64.1	
Acceptable Variation*		+/-10%	+/- 0.2 °C	+/-0.1 pH	+/-5%	+/-10mV	**Results Acceptable: YES / NO**

LOW FLOW: Typical flow rate = 0.2- 0.4 L/min - Max. drawdown = 0.1 m - Well stable when 3 consecutive readings (either 3min apart or 1L apart)

PURGE: Min. sampling volume is 4 casing volumes or dry twice - 1 casing volume (50mm wells) = 2 L/m - 1 casing volume (100mm wells) = 8 L/m

Clarity:	very turbid	**Sheen:**	YES / (NO)
Colour:	dark brown	**Odour:**	YES / (NO)

Primary sample ID:		**No.**	**Container / Preservative**
Duplicate sample:	YES / (NO) ID:		4x vials
Triplicate sample:	YES / (NO) ID:		
Rinsate sample:	(YES) / NO ID:		
Sample on ice:	(YES) / NO		
Field Filter Method:	0.45µm Filter / (Not Filtered)		
Water Quality Meter:	YSI		
Guaging Equipment:	IP		
Pump Type:	bladder		

Notes:

Calculated Well Volume (L) = Water Column Depth (m) * Conversion Factor (from table)

Casing Diameter	25mm	50mm	100mm	150mm	300mm
Conversion Factor	0.98	1.96	7.85	49.1	196.3

Volume of water in well (L) = π * radius of gravel pack (m)^2 * height of water column (m)

*SA EPA Guidelines (June 2007) as referenced in NEPM

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Gas Sampling Form

JBS&G

Project Number: 52373	Date: 17-4-18	Sampler/s: RH CB
Site Address: Penrith	Sample Method: Low flow	Weather: Fine - hot
Well ID/Grid Area:	Wind Strength:	Wind Direction:

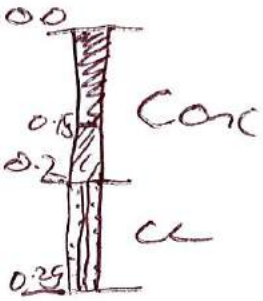
Leaktest

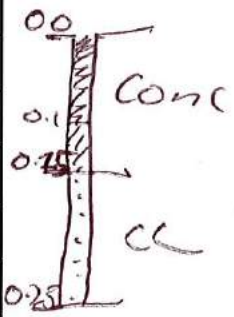
Field Measurements

Pump ID (2227)

Time	Location Code (well or grid point)	Flow Rate (L/hour)	Barometric Pressure (mb)	Relative Pressure (mb)	CH_4 (%)	CO_2 (%)	O_2 (%)	Balance (%)	PID H_2S (ppm)
10:35	SU14	Pass	1010		—	0.00	20.5	—	42.1
10:36	↓	Pass	↓		—	0.03	20.5	—	47.3
10:37		Pass			—	0.03	20.5	—	50.4
10:38		Pass			—	0.03	20.5	—	52.3
10:39	↓	Pass	↓		—	0.03	20.5	—	53.1
			Sampled @ 4 min purge						
	Pump on @ 10:42 - 0.2 L/min								
	Pump off @ 12:42 - 2hrs @ 0.2 L/min - 24L								
11:02	SU15	Pass	1019		—	0.31	18.4	—	2.0
11:03	↓	Pass	↓		—	0.55	18.2	—	1.6
11:04		Pass			—	0.76	18.1	—	1.3
11:05		Pass			—	0.71	18.1	—	1.6
11:06	↓	Pass	↓		—	0.73	18.1	—	1.5
	Sampled @ 4 min purge								
	+ QC20180417 - on splitter								
	Pump on 11:11 @ 0.2 L/min								
	End @ 13:11 - 2hrs @ 0.2 L/min - 24L								

10910 & 12234





Comments (Odour, Wind, Grass Moisture, Well Condition etc):

SU14 nearby to compromised concrete / cracks

↳ collected SU14-1L in case breakthrough occurs

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Gas Sampling Form

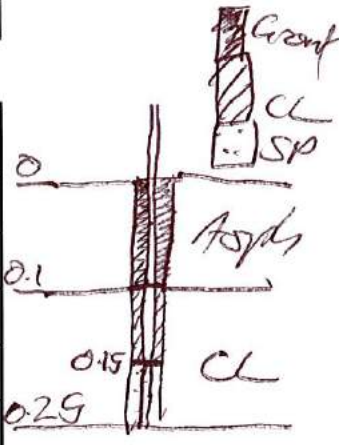
JBS&G

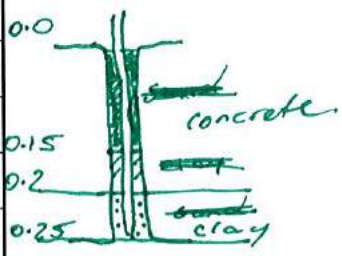
Project Number:	52372	Date:	17-4-18	Sampler/s:	RH CB
Site Address:	144 Henry St	Sample Method:	Pump	Weather:	Fine
Well ID/Grid Area:		Wind Strength:	Mod	Wind Direction:	S→N

Leak Test PIF

Field Measurements

Pump ID	Time	Location Code (well or grid point)	Flow Rate (L/Hour)	Barometric Pressure (mb)	Relative Pressure (mb)	CH_4 (%)	CO_2 (%)	O_2 (%)	Balance (%)	PID ~~H_2S~~ (ppm)
10913	11:26	SV16	Pass	1022		-	0.31	20.3	-	1.7
	11:27	↓	Pass	↓		-	0.97	20.1	-	1.5
	11:28		Pass			-	1.00	20.1	-	1.3
	11:29		Pass			-	1.00	20.1	-	1.4
	11:30	↓	Pass	↓		-	1.01	20.1	-	1.5
			Sampled @ 4 min purge - parameters stable							
			Sampled @ 11:31 - 0.2L/min							
			End @ 13:31 2hrs - 24L							
12227	1:06	SV17	Pass	1019		-	0.6	20.9	-	1.0
	1:07	↓	Pass	↓		-	0.10	20.7	-	1.1
	1:08		Pass			-	0.14	20.7	-	0.9
	1:09	↓	Pass	↓		-	0.14	20.6	-	0.8
		Sampled @ 1:14pm - 0.2L/min.								
		End @ 5:14pm - 2hrs - 24L								
		Sampled @ 3 min purge parameters Stable								





Comments (Odour, Wind, Grass Moisture, Well Condition etc):

SV16 SS installed into asphalt ~0.1 m depth

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Gas Sampling Form

JBS&G

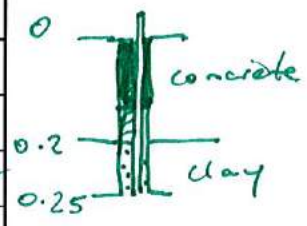
Project Number:	52372	Date:	17.4.18	Sampler/s:	RM CB
Site Address:	Penrith	Sample Method:	low Flow	Weather:	Fine
Well ID/Grid Area:	Henry St	Wind Strength:	Mod	Wind Direction:	S-W

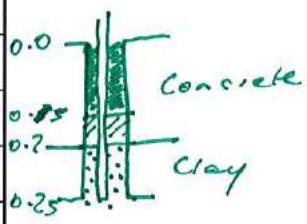
Pump ID

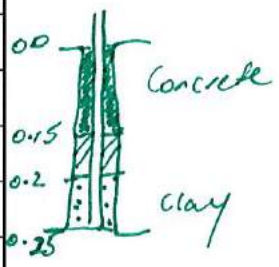
leak test Pass/fail

Field Measurements

Time	Location Code (well or grid point)	~~Flow~~ Rate (L/hour)	Barometric Pressure (mb)	Relative Pressure (mb)	CH_4 (%)	CO_2 (%)	O_2 (%)	Balance (%)	PID ~~H_2S~~ (ppm)
12234 1:37	SV12	P	~~10~~ 1		–	0.0	20.7	–	0.5
1:38	↓	P	1018		–	0.0	20.7	–	0.7
1:39	↓	P	↓		–	0.0	20.7	–	0.5
1:42	↓	P	↓		–	0.0	20.7	–	0.5
	Sampled @ 1:45				@0.2L/min				
	End @ 3:45pm				2hrs - 24L				
10910 1:47	SV11	P	786		–	0.38	20.1	–	1.4
1:48	↓	P			–	0.41	20.1	–	1.3
1:49	↓	P			–	0.41	20.1	–	1.3
	Sampled @ 1:51pm				@0.2L/min				
	End @ 3:51pm				2hrs - 24L				
10913 1:58	SV13	P	1020		–	0.0	20.9	–	0.9
1:59	↓	P			–	0.0	20.9	–	0.8
2:00	↓	P			–	0.0	20.9	–	0.8
2:01		P			–	0.0	20.9	–	0.7
	Sampled @ 2:04pm				@0.2L/min				
	End @ 4:04pm				2hrs - 24L				







Comments (Odour, Wind, Grass Moisture, Well Condition etc):

Minor variation of ground gas constituents noted along

12287
12284
10910
10913

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Version: 1, Version Date: 14/04/2021

Vapour Purging Form

JBS&G

Project Number: 55073	Date: 15.11.18	Sampler/s: CB
Site Address: Penrith	Purging Instrument: MX6 (300mL/min)	Weather: Fine-Storm (afternoon)

Field Measurements

Borehole ID	Time	Oxygen (%)	Carbon Dioxide (%)	PID	LEL	Methane	Leak Detection	
SV18	10:50	16.5	0.3	38.6	0	0		Start - 10:58am
	10:51	16.4	0.4	39.2				Off - 11:58am
	10:52	16.3	0.4					
	10:53							
	10:54							
QA-V	1:03			66.7				Start - 12:01pm
"	1:05			66.9				Off - 1:01pm
SV19	11:09	12.3	6.4	242.9	0	0		Start - 11:15am
	11:10	12.2	6.5	244.6				Off - 12:15pm
	11:11			244.9				
	11:12							
	11:13							
QC-V	~~1:18~~ 1:18			209.6				Start - 12:16
	~~1:19~~ 1:19			209.9				Off - 1:16

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Version: 1, Version Date: 14/04/2021

Appendix K Surveyors Report

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

16 April 2018

Our Ref: 12028

RE: MONITORIN WELLS
PROPERTY: ENRY STREET ALLEN PLACE PENRIT

	MA COORDINATES		ADEITS		
Point	**Easting**	**Northing**	**Top of Pipe**	**Surface Level**	**Type**
JBMW01	286582.1	6262950.0	27.555	27.635	Flush
JBMW02	286636.0	6262944.7	27.455	27.54	Flush
JBMW03	286658.1	6262932.3	27.71	27.845	Flush
JBMW04	286586.3	6262919.0	27.515	27.59	Flush
PSM01	286626.3	6262910.5	27.56	27.695	Flush
PSM02	286651.5	6262867.3	27.795	27.865	Flush
PSM03	286780.3	6262853.4	28.81	28.91	Flush

Methodology: RTK GNSS for position (+/-10mm)
Differential leveling for MW height (+/-3mm)

AHD Origin: PM 12654 RL 28.650

Stuart de Nett | Registered Surveyor | E: office@landsurveyors.net.au | W: www.landsurveyors.net.au |
PH: 9526 6333 | Unit 4A, 38 Waratah Street, Kirrawee | PO Box 490, Gymea NSW 2227

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix L Meteorological Conditions during Sampling Events

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Australian Government
Bureau of Meteorology

Penrith, New South Wales
April 2018 Daily Weather Observations

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9 am						3 pm					
		Min	Max				Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	8th		km/h	hPa	°C	%	8th		km/h	hPa
1	Su	16.3	34.4	0			NNE	26	15:40	22.4	72		SSE	2		34.1	32		ENE	7	
2	Mo	18.0	34.0	0			S	28	18:36	22.4	74		NNE	2		32.9	33		W	6	
3	Tu	18.8	24.7	3.6			SE	20	18:50	21.6	76		SW	7		24.0	62		WNW	4	
4	We	19.2	27.9	0			ESE	22	16:17	23.1	67		SW	6		26.9	47		SE	7	
5	Th	16.8	30.5	0.2			N	26	11:53	22.4	73		N	6		30.0	40		NE	7	
6	Fr	15.1	29.4	0.2			SE	28	16:43	21.2	80		ENE	6		28.6	53		NNW	13	
7	Sa	20.1	31.3	0			NE	26	14:44	24.6	64		N	2		31.0	36		NNE	17	
8	Su	16.1	32.0	0			ENE	20	15:44	22.3	79		N	6		31.7	36		NNE	11	
9	Mo	13.7	35.8	0			SE	44	16:00	22.2	58		SSW	4		35.0	16		SW	19	
10	Tu	17.3	29.0	0			ENE	26	17:05	22.5	55		NNW	4		27.2	38		ESE	4	
11	We	15.8	32.3	0			NNE	15	15:49	21.9	64		NW	2		31.8	38		NW	6	
12	Th	15.9	35.2	0			WSW	26	14:39	22.7	69		E	2		34.4	27		W	11	
13	Fr	16.4	35.0	0			WNW	56	23:48	26.4	41		Calm			34.1	25		NNW	9	
14	Sa	21.9	31.9	0			NW	63	15:24	25.6	44		N	19		30.3	25		WNW	31	
15	Su	17.9	25.0	0			W	56	10:13	19.4	38		WNW	30		24.6	32		NW	26	
16	Mo	14.1	29.1	0			WNW	44	13:05	23.1	48		SSE	4		28.2	33		W	22	
17	Tu	13.7	26.8	0			ESE	30	14:20	21.0	54		S	6		21.3	58		SE	19	
18	We	15.1	23.1	0			N	17	12:29	19.3	57		S	2		22.2	44		NE	4	
19	Th	12.2	26.6	0			N	19	17:44	18.2	68		N	4		21.1	85		N	2	
20	Fr	13.6	28.7	1.8			ESE	26	15:15	19.3	77		NNW	2		27.2	42		ESE	9	
21	Sa	17.7	26.2	0.2			SE	28	15:57	20.8	70		SSE	9		25.2	45		SSW	4	
22	Su	14.4	26.1	0			ESE	19	16:26	20.2	62		S	7		24.6	41		NNW	4	
23	Mo	13.0	27.9	0			NE	22	12:06	17.7	74		SE	2		26.5	38		ESE	6	
24	Tu	13.9	27.6	0			SSE	19	13:31	19.8	71		S	4		27.3	30		SSE	4	
25	We	10.8	27.4	0			SW	24	10:20	17.0	70		ESE	2		23.5	62		SE	9	
26	Th	14.2	28.7	0.2			SSW	41	11:35	19.0	84		NNW	4		24.1	59		SE	22	
27	Fr	16.5	23.4	0			SE	28	15:46	18.2	66		S	13		20.4	48		SSE	13	
28	Sa	13.8	20.8	0			SSW	26	11:30	13.9	81		SSE	11		19.5	63		S	7	
29	Su	13.0	24.3	2.0			SW	33	21:14	19.5	57		SSW	13		23.0	37		SSW	6	
30	Mo	10.9	23.6	14.4			SSW	26	09:18	16.1	71		SSW	13		22.3	49		S	11	
Statistics for April 2018																					
	Mean	15.5	28.6							20.8	65			6		27.1	42			10	
	Lowest	10.8	20.8	0						13.9	38		Calm			19.5	16		N	2	
	Highest	21.9	35.8	14.4			NW	63		26.4	84		WNW	30		35.0	85		WNW	31	
	Total			22.6																	

IDCJDW2111.201804 Prepared at 13:00 UTC on Monday 21 May 2018

Source of data

Observations were drawn from Penrith Lakes AWS {station 067113}.
You should read the **important information** in these notes.

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May 18 Apr 18 Mar 18 Feb 18 Jan 18 Dec 17 Nov 17 Oct 17
Sep 17 Aug 17 Jul 17 Jun 17 May 17 Apr 17

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Document Set ID: 9567729
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547739
Version: 1, Version Date: 14/04/2021

Australian Government
Bureau of Meteorology

Penrith, New South Wales
May 2018 Daily Weather Observations

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9 am						3 pm					
		Min	Max				Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	8th		km/h	hPa	°C	%	8th		km/h	hPa
1	Tu	9.1	25.6	0			ENE	13	15:54	14.5	83		NNW	4		24.3	25		S	4	
2	We	10.2	21.7	0			NW	11	13:04	15.3	79		Calm			21.1	56		Calm		
3	Th	10.0	29.2	0			NE	20	16:26	13.5	98		Calm			27.5	36		E	6	
4	Fr	13.5	27.5	0			NW	63	11:14	21.0	63		ENE	4		23.7	30		WNW	19	
5	Sa	6.4	24.3	0			NW	15	13:39	15.1	56		Calm			23.5	24		NNE	6	
6	Su	5.4	24.1	0			NNE	20	14:50	12.9	67		Calm			22.8	32		NE	15	
7	Mo	7.8	26.1	0			N	35	15:28	13.3	79		Calm			25.2	37		NE	19	
8	Tu	8.6	25.9	0			NE	13	15:27	12.1	86		S	4		25.6	34		N	4	
9	We	9.0	25.9	0			NNE	15	16:01	15.2	78		Calm			25.5	37		NNE	6	
10	Th	9.3	26.1	0			NW	57	13:04	11.9	85		Calm			24.6	24		WNW	24	
11	Fr	8.9	18.9	0			WNW	46	13:42	12.6	44		NW	19		14.8	39		W	24	
12	Sa	11.6	20.0	0			WSW	54	14:14	18.7	43		WSW	22		18.3	50		WSW	22	
13	Su	13.7	21.0	0			SSW	48	06:17	17.0	50		SSW	20		18.9	50		S	20	
14	Mo	14.3	21.4	0			SSW	41	10:30	16.9	56		SSW	20		20.4	43		SSE	15	
15	Tu	7.5	22.2	0			SE	24	17:09	14.1	72		Calm			21.1	33		SSE	4	
16	We	9.1	20.4	0			SSE	26	12:59	15.2	58		SSW	11		18.4	52		ESE	11	
17	Th	7.0	20.9	0			N	20	11:36	11.8	89		N	4		20.6	41		NNE	7	
18	Fr	4.7	21.9	0			SSE	20	12:43	11.3	77		Calm			21.9	30		S	6	
19	Sa	4.9	21.4	0			NE	15	14:18	11.4	82		N	2		20.8	39		E	4	
20	Su	3.9	20.7	0			SSW	17	19:47	9.9	79		Calm			19.8	38		NNE	7	
21	Mo	5.9	22.6	0			WNW	33	13:10	13.3	67		NNW	4		21.2	33		W	17	
22	Tu	4.6		0						11.1	79		NW	6							
Statistics for the first 22 days of May 2018																					
Mean		8.4	23.2							14.0	71			5		21.9	37			11	
Lowest		3.9	18.9	0						9.9	43		Calm			14.8	24		Calm		
Highest		14.3	29.2	0			NW	63		21.0	98		WSW	22		27.5	56		#	24	
Total				0.0																	

IDCJDW2111.201805 Prepared at 23:36 UTC on Monday 21 May 2018

Source of data

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Document Set ID: 9547739
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547739
Version: 1, Version Date: 14/04/2021

Australian Government
Bureau of Meteorology

Penrith, New South Wales
November 2018 Daily Weather Observations

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9 am						3 pm					
		Min	Max				Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	8th		km/h	hPa	°C	%	8th		km/h	hPa
1	Th	17.8	35.6	0			NNW	22	16:06	23.0	72		NE	11		33.3	39		SW	4	
2	Fr	19.2	38.0	0			WSW	70	19:08	30.3	28		NW	15		36.2	20		NW	20	
3	Sa	20.2	34.8	3.4			NW	44	08:31	29.2	44		NW	31		33.9	20		WNW	24	
4	Su	17.4	30.5	0			NNE	28	11:36	21.3	67		NNE	4		28.6	38		NNE	13	
5	Mo	16.8	29.9	0			W	30	16:50	20.9	76		SE	4		28.5	45		NNW	4	
6	Tu	20.2	34.5	0			W	43	15:29	24.1	66		ESE	4		32.6	37		SE	2	
7	We	21.2	25.6	0			SSW	43	19:16	25.2	62		SSE	7		21.5	98		NNE	9	
8	Th	11.7	22.7	7.6			SSE	35	12:09	17.1	54		WSW	17		20.9	38		SE	11	
9	Fr	10.3	25.5	0.2			ENE	31	16:18	16.9	62		NNE	4		23.3	36		NNE	13	
10	Sa	10.9	26.4	0			ESE	37	13:06	18.4	64		SSE	4		23.9	39		SE	24	
11	Su	10.9	29.0	0			ENE	35	15:09	19.1	61		NNE	4		27.6	40		ESE	20	
12	Mo	13.5	28.6	0			NE	35	11:10	20.6	66		SE	4		27.9	38		NE	13	
13	Tu	14.2	31.0	0			ENE	30	16:00	20.7	68		SSE	6		30.1	25		ENE	11	
14	We	17.4	23.4	0			NE	15	14:46	19.0	95		Calm			22.5	76		NNE	9	
15	Th	14.7	28.1	0.4			SE	41	12:10	23.3	74		S	6		20.0	77		SE	22	
16	Fr	14.7	21.1	8.4			S	17	09:17	18.2	74		SSW	7		20.2	70		WSW	4	
17	Sa	13.3	23.6	0			SSE	37	13:58	17.5	92		SW	6		21.2	63		SSE	24	
18	Su	14.4	23.8	1.4			ESE	26	15:42	18.7	73		SSW	9		20.9	53		ESE	13	
19	Mo	11.5	26.1	0			ESE	30	13:54	16.8	81		Calm			24.4	49		ESE	19	
20	Tu	13.0	31.2	0.2			E	33	14:22	19.0	76		NNE	2		31.0	39		ENE	11	
21	We	19.0	28.9	0			NNW	46	14:37	24.6	74		NNW	9		27.9	47		SW	9	
22	Th	15.9	25.7	2.0			WNW	69	17:35	20.3	52		W	9		25.1	22		WNW	30	
23	Fr	13.0	24.4	0.2			W	72	15:59	18.3	41		NW	26		23.5	30		WNW	33	
24	Sa	15.3	26.9	0			SW	52	16:47	20.0	41		WSW	17		24.0	31		WSW	19	
25	Su	12.2	29.1	0			SSW	35	11:20	20.8	46		NNW	4		26.9	24		WSW	24	
26	Mo	12.8		0						21.6	43		S	13		26.0	34		SE	15	
Statistics for the first 26 days of November 2018																					
Mean		15.1	28.2							21.0	63			8		26.2	43			15	
Lowest		10.3	21.1	0						16.8	28		Calm			20.0	20		SE	2	
Highest		21.2	38.0	8.4			W	72		30.3	95		NW	31		36.2	98		WNW	33	
Total				23.8																	

IDCJDW2111.201811 Prepared at 05:36 UTC on Monday 26 November 2018

Source of data

Observations were drawn from Penrith Lakes AWS {station 067113}.
You should read the **important information** in these notes.

Other formats

To **print** this page, get the PDF version (one page, 45 kb).
To use this page in a **spreadsheet**, get the plain text version (4 kb).

Other times and other places

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Nov 18 Oct 18 Sep 18 Aug 18 Jul 18 Jun 18 May 18 Apr 18
Mar 18 Feb 18 Jan 18 Dec 17 Nov 17 Oct 17

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Climate statistics

If you are after **long-term averages** relevant to Penrith, New South Wales, look at the tables for Penrith Lakes AWS, Richmond RAAF, Sydney Airport AMO, Parramatta North (Masons Drive) or Prospect Reservoir.

Maps and tables of average conditions for locations across Australia are also available.

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Document Set ID: 9547739
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547739
Version: 1, Version Date: 14/04/2021

Australian Government
Bureau of Meteorology

Richmond, New South Wales
April 2018 Daily Weather Observations

Most observations from the RAAF base, but evaporation from the Hawkesbury campus of the University of Western Sydney.

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9 am						3 pm					
		Min	Max				Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	8th		km/h	hPa	°C	%	8th		km/h	hPa
1	Su	15.1	33.7	0	2.8		NE	26	15:05	18.6	99	8	SE	2	1016.6	33.5	36		NE	19	1011.5
2	Mo	16.5	33.3	0	4.6		SE	48	16:46	20.9	84		N	6	1014.5	32.1	39	4		Calm	1011.5
3	Tu	19.8	25.1	0	3.0		ESE	24	18:53	21.1	80	8	WSW	9	1022.6	24.1	60		SSE	7	1019.7
4	We	18.8	27.3	0	2.2		SW	50	03:52	22.1	70		SSW	9	1021.8	26.7	54	1	E	11	1018.0
5	Th	15.4	29.8	0	2.6		NNE	28	11:01	22.1	76		NE	7	1018.2	29.1	43		NE	13	1013.8
6	Fr	13.4	29.7	0	5.0		ESE	28	17:41	20.2	90	8	Calm		1018.8	29.2	54		N	9	1015.4
7	Sa	17.4	31.0	0			NNE	30	15:02	22.7	82		N	6	1021.2	30.5	37		NE	20	1015.7
8	Su	14.6	32.1	0			NE	28	16:20	20.9	86	8	N	4	1020.9	31.4	37		NE	17	1015.2
9	Mo	11.9	35.9	0	11.2		SSE	52	16:28	22.5	64		ESE	4	1017.7	35.6	16	1	NNE	4	1013.0
10	Tu	16.0	27.2	0	5.6		E	30	16:55	22.2	62		NW	7	1022.7	26.0	45	4	N	7	1019.9
11	We	15.3	31.4	0	4.2		NNE	22	10:14	22.6	69		NE	13	1021.7	30.9	42		ENE	11	1016.7
12	Th	13.4	35.0	0	4.8		WNW	39	12:43	23.5	68		Calm		1017.0	34.4	27		N	20	1011.2
13	Fr	18.8	34.3	0	6.0		NW	46	21:55	27.9	32	1	NE	13	1013.1	33.7	27	2	N	22	1007.8
14	Sa	21.8	31.8	0			WSW	65	21:37	25.0	51		NNW	28	1006.1	31.5	28	2	NW	31	999.8
15	Su	18.0	25.6	0			W	59	11:13	20.1	38		W	24	1006.7	25.2	31		WSW	22	1005.8
16	Mo	13.6	29.7	0	18.7		W	43	11:50	24.9	43		W	20	1011.7	29.5	32		W	15	1010.2
17	Tu	11.4	25.9	0	6.2		ESE	39	14:31	20.4	65		S	2	1021.8	22.2	58	4	ESE	24	1020.4
18	We	12.8	22.5	0	3.6		NE	26	18:34	18.5	65	7	S	6	1026.3	21.6	51	8	NE	9	1022.2
19	Th	10.3	26.1	0	2.4		NE	22	17:02	17.4	76	2	ENE	6	1021.8	19.1	89	7	NNW	13	1017.5
20	Fr	13.1	27.6	2.0	1.3		SE	31	16:34	16.5	99	7	N	7	1021.7	26.3	47		E	11	1018.1
21	Sa	16.5	25.3	0.2			SE	30	15:18	20.4	76		SSE	11	1024.0	25.1	47	8	S	11	1020.5
22	Su	13.9	25.8	0			E	26	16:11	19.5	68		SSW	9	1024.3	24.8	43	1	N	11	1020.6
23	Mo	11.6	26.9	0	9.4		ESE	30	15:55	17.9	81		NNE	2	1021.5	26.1	41		NNE	9	1017.7
24	Tu	13.4	26.8	0	3.4		SE	26	13:25	19.0	78		SW	9	1020.3	26.0	34		ESE	9	1016.4
25	We	8.6	26.0	0			S	30	15:05	15.6	78	5	WSW	11	1017.0	25.0	56	1	S	19	1013.5
26	Th	14.6	28.7	0	5.5		SE	41	15:00	18.7	83		NE	7	1015.0	23.7	58		SE	30	1014.0
27	Fr	16.7	22.0	0	3.8		S	33	09:29	18.1	65	8	S	19	1023.9	20.6	47	8	SSE	20	1023.1
28	Sa	13.5	21.3	0.4			SE	33	15:35	15.3	91	8	S	11	1026.5	20.5	56	8	SSE	13	1023.8
29	Su	10.2	23.8	1.2			SSW	46	21:45	16.7	77	3	SE	7	1026.1	21.5	46	1	E	9	1023.4
30	Mo	8.4	22.4	7.0	7.2		SE	30	15:20	14.5	88	4	Calm		1027.1	20.6	56	6	SE	11	1024.9
Statistics for April 2018																					
Mean		14.5	28.1		5.4					20.2	72	5		8	1019.6	26.9	44	4		14	1016.0
Lowest		8.4	21.3	0	1.3					14.5	32	1	Calm		1006.1	19.1	16	1		Calm	999.8
Highest		21.8	35.9	7.0	18.7		WSW	65		27.9	99	8	NNW	28	1027.1	35.6	89	8	NW	31	1024.9
Total				10.8	113.5																

IDCJDW2119.201804 Prepared at 13:00 UTC on Monday 21 May 2018

Source of data

Temperature, humidity, wind, pressure, cloud and rainfall observations are from Richmond RAAF {station 067105}. Evaporation observations are from Richmond - UWS Hawkesbury {station 067021}.

These evaporation observations will generally be available about month after they are made.

You should read the **important information** in these notes.

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Document ID: 959729
Version: 1, Version Date: 14/04/2021

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Australian Government
Bureau of Meteorology

Richmond, New South Wales
May 2018 Daily Weather Observations

Most observations from the RAAF base, but evaporation from the Hawkesbury campus of the University of Western Sydney.

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9 am						3 pm					
		Min	Max				Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	8th		km/h	hPa	°C	%	8th		km/h	hPa
1	Tu	7.4	24.5	0			NNE	15	14:07	13.0	98	3	E	2	1028.1	24.1	30		NNE	7	1023.8
2	We	8.7	20.9	0.2			WSW	11	13:16	14.0	84		Calm		1023.3	20.3	63		SW	6	1018.8
3	Th	9.0	29.0	0			NNE	28	15:52	14.2	93		Calm		1020.5	28.0	28		N	17	1015.3
4	Fr	14.2	28.2	0			W	69	12:11	21.0	59		ENE	9	1013.5	23.4	28		WSW	35	1014.7
5	Sa	4.0	23.6	0			NE	19	13:16	13.0	65		N	4	1028.0	23.1	25		NE	4	1026.2
6	Su	3.7	23.0	0			ENE	19	12:41	11.8	76		Calm		1032.3	22.3	38		ENE	11	1028.3
7	Mo	5.7	26.1	0			NE	31	14:21	13.5	85		NE	7	1026.5	25.2	37		NE	22	1019.6
8	Tu	6.9	25.3	0			E	15	14:47	12.9	76		S	2	1022.5	24.6	42		E	9	1020.4
9	We	7.4	26.6	0			ENE	20	13:12	13.6	83		NNE	4	1022.0	25.9	33		ENE	13	1015.7
10	Th	7.2	27.3	0			NW	63	13:19	16.9	60		NE	7	1011.9	24.1	22	1	NW	30	1005.3
11	Fr	7.0	18.3	0			W	52	13:08	13.2	44	1	NNW	17	1010.5	15.1	38	8	W	22	1009.1
12	Sa	9.9	21.0	0			SSW	57	10:43	18.3	46	8	W	17	1008.3	18.6	49	8	SW	28	1011.6
13	Su	13.3	20.2	0			SSW	48	10:27	17.0	52	3	SSW	28	1019.7	18.8	52	7	S	24	1020.1
14	Mo	13.4	21.0	0			SSW	39	08:49	16.8	58		SSW	24	1025.9	19.7	48	8	SSE	20	1023.5
15	Tu	5.1	21.4	0			ESE	28	17:28	12.7	74		Calm		1023.8	20.6	38		NNE	9	1020.1
16	We	7.0	19.9	0			SE	30	13:09	15.4	59		SSW	15	1027.5	18.7	51	8	SE	17	1025.4
17	Th	4.9	20.9	0			NE	24	12:28	11.2	88		Calm		1027.5	20.4	42		ENE	13	1021.9
18	Fr	1.4	22.1	0			SSW	26	13:35	8.8	92		Calm		1022.2	20.8	32		SE	9	1019.3
19	Sa	2.1	21.6	0			SE	20	02:29	10.9	76		NNE	4	1024.4	20.1	40		ESE	9	1019.5
20	Su	0.3	21.5	0			SSW	24	19:21	8.5	82		ESE	4	1020.8	21.2	35		ENE	9	1016.9
21	Mo	3.4	23.2	0			WSW	44	11:37	13.5	67		NE	7	1020.7	21.8	31		W	24	1017.6
22	Tu	2.1		0						12.5	68		NE	4	1020.1						
Statistics for the first 22 days of May 2018																					
Mean		6.6	23.1							13.8	72	3		7	1021.8	21.8	38	6		16	1018.7
Lowest		0.3	18.3	0						8.5	44	1	Calm		1008.3	15.1	22	1	NE	4	1005.3
Highest		14.2	29.0	0.2			W	69		21.0	98	8	SSW	28	1032.3	28.0	63	8	WSW	35	1028.3
Total				0.2																	

IDCJDW2119.201805 Prepared at 23:36 UTC on Monday 21 May 2018

Source of data

Temperature, humidity, wind, pressure, cloud and rainfall observations are from Richmond RAAF {station 067105}. Evaporation observations are from Richmond - UWS Hawkesbury {station 067021}.

These evaporation observations will generally be available about month after they are made.

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Document Set ID: 9547739
Version: 1, Version Date: 14/04/2021

Australian Government
Bureau of Meteorology

Richmond, New South Wales
November 2018 Daily Weather Observations

Most observations from the RAAF base, but evaporation from the Hawkesbury campus of the University of Western Sydney.

Date	Day	Temps		Rain	Evap	Sun	Max wind gust			9 am						3 pm					
		Min	Max				Dir	Spd	Time	Temp	RH	Cld	Dir	Spd	MSLP	Temp	RH	Cld	Dir	Spd	MSLP
		°C	°C	mm	mm	hours		km/h	local	°C	%	8th		km/h	hPa	°C	%	8th		km/h	hPa
1	Th	17.3	35.5	0.2			N	26	08:55	21.5	78	1	NE	11	1022.5	34.2	33		WSW	9	1015.7
2	Fr	18.6	37.4	0			WSW	69	19:27	30.8	28		NW	22	1016.7	36.5	18		NNW	33	1010.8
3	Sa	20.6	35.0	3.6			NW	52	07:31	29.4	44		WNW	26	1011.5	34.0	21		WSW	26	1009.1
4	Su	16.6	30.1	0			ESE	37	15:26	21.0	73	6	NE	6	1016.1	29.4	41		NE	11	1009.2
5	Mo	14.1	30.5	0			NNW	50	15:24	20.5	81		NW	4	1010.7	29.1	44	7	W	11	1008.9
6	Tu	20.0	32.9	0			WNW	35	16:03	24.7	61	1	S	6	1007.9	31.7	40		SSE	6	1003.3
7	We	21.3	25.3	0			SSW	50	20:03	24.9	59		Calm		1005.1	21.7	98	8	NE	11	1005.0
8	Th	11.7	22.6	7.2			ESE	35	13:20	16.8	57		SSE	6	1015.5	19.6	40	5	ESE	22	1015.7
9	Fr	9.1	24.8	0.2			E	39	16:49	15.9	72		NNE	2	1023.0	24.4	35	4	NNE	17	1016.8
10	Sa	9.9	25.6	0			ESE	39	14:09	18.2	63		SSE	7	1019.2	23.5	33	5	SE	30	1016.7
11	Su	9.4	28.1	0			ENE	46	13:58	18.5	66		ENE	6	1021.8	27.3	41		E	20	1017.8
12	Mo	11.3	27.7	0			ENE	31	15:38	19.8	69	8	Calm		1024.1	27.0	42	1	NE	19	1019.1
13	Tu	13.0	30.6	0			ENE	33	17:45	19.8	67		NNE	7	1020.0	29.7	29		ENE	13	1014.9
14	We	16.3	22.9	0			ENE	15	12:29	18.7	93	8	NNW	7	1016.4	22.2	76	8	NE	11	1014.7
15	Th	12.9	27.9	0.4			SE	50	12:31	22.0	76		ESE	9	1017.9	20.0	74	8	SE	26	1019.0
16	Fr	14.8	21.6	7.0			SW	22	00:27	17.8	70	7	S	13	1021.7	19.1	70	8	SSE	15	1019.2
17	Sa	12.7	23.9	0.2			SSE	43	16:58	17.1	83	8	SW	7	1019.7	22.2	58	8	SE	24	1019.0
18	Su	14.3	23.9	9.4			ESE	31	12:47	18.4	73	8	SSW	13	1023.9	21.5	48	8	ESE	19	1022.2
19	Mo	9.9	25.6	0			ESE	35	14:04	16.5	84	8	Calm		1022.6	24.8	50	7	ESE	28	1016.9
20	Tu	12.9	30.5	0			ESE	35	13:47	18.2	79	8	Calm		1015.2	29.7	42	1	E	24	1006.7
21	We	18.1	28.7	0			WNW	59	11:44	24.5	66		N	22	1001.2	28.1	44	7	NW	11	998.5
22	Th	15.2	25.4	1.8			WNW	76	09:38	20.3	52	8	NW	17	998.2	23.7	20		WNW	43	997.9
23	Fr	14.4	23.9	0.8			WNW	78	11:12	18.1	41	1	WNW	37	1001.7	22.8	28	1	WNW	39	1000.3
24	Sa	13.5	26.3	0			WSW	56	11:53	20.1	40		WSW	20	1003.2	25.2	32	6	W	26	1001.4
25	Su	10.3	30.0	0			W	43	13:30	20.6	52		N	9	1001.9	29.2	23	5	SW	24	997.3
26	Mo	10.6		0						21.2	47		SSW	20	1005.2	24.5	38	6	SE	17	1004.4
Statistics for the first 26 days of November 2018																					
Mean		14.2	27.9							20.6	64	6		10	1014.0	26.2	43	5		20	1010.8
Lowest		9.1	21.6	0						15.9	28	1	Calm		998.2	19.1	18	1	SSE	6	997.3
Highest		21.3	37.4	9.4			WNW	78		30.8	93	8	WNW	37	1024.1	36.5	98	8	WNW	43	1022.2
Total				30.8																	

IDCJDW2119.201811 Prepared at 05:36 UTC on Monday 26 November 2018

Source of data

Temperature, humidity, wind, pressure, cloud and rainfall observations are from Richmond RAAF {station 067105}. Evaporation observations are from Richmond - UWS Hawkesbury {station 067021}.

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Document Set ID: 9547329
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547739
Version: 1, Version Date: 14/04/2021

Appendix M Analytical Result Statistical Analyses

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Nonparametric Background Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	25/05/2018 15:48
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Coverage	95%
Number of Bootstrap Operations	2000

Lead

General Statistics

Total Number of Observations	40	Number of Distinct Observations	30
Minimum	5	First Quartile	9.75
Second Largest	430	Median	20.5
Maximum	910	Third Quartile	59.75
Mean	71.47	SD	156.8
Coefficient of Variation	2.194	Skewness	4.448
Mean of logged Data	3.274	SD of logged Data	1.274

Critical Values for Background Threshold Values (BTVs)

Tolerance Factor K (For UTL)	2.117	d2max (for USL)	2.868

Nonparametric Distribution Free Background Statistics
Data do not follow a Discernible Distribution (0.05)

Nonparametric Upper Limits for Background Threshold Values

Order of Statistic, r	40	95% UTL with 95% Coverage	910
Approximate f	2.105	Confidence Coefficient (CC) achieved by UTL	0.871
95% Percentile Bootstrap UTL with 95% Coverage	910	95% BCA Bootstrap UTL with 95% Coverage	910
95% UPL	420.5	90% Percentile	120
90% Chebyshev UPL	547.8	95% Percentile	249.5
95% Chebyshev UPL	763.5	99% Percentile	722.8
95% USL	910		

Note: The use of USL to estimate a BTV is recommended only when the data set represents a background data set free of outliers and consists of observations collected from clean unimpacted locations.
The use of USL tends to provide a balance between false positives and false negatives provided the data represents a background data set and when many onsite observations need to be compared with the BTV.

Nonparametric UCL Statistics for Uncensored Full Data Sets

User Selected Options

Date/Time of Computation	25/05/2018 15:44
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Copper

General Statistics

Total Number of Observations	38	Number of Distinct Observations	26
		Number of Missing Observations	0
Minimum	5	Mean	27.78
Maximum	230	Median	16
SD	46.67	Std. Error of Mean	7.57
Coefficient of Variation	1.68	Skewness	3.733
Mean of logged Data	2.768	SD of logged Data	0.912

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution (0.05)

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	40.55	95% Adjusted-CLT UCL (Chen-1995)	45.13
		95% Modified-t UCL (Johnson-1978)	41.31

Nonparametric Distribution Free UCLs

95% CLT UCL	40.23	95% Jackknife UCL	40.55
95% Standard Bootstrap UCL	39.83	95% Bootstrap-t UCL	69.72
95% Hall's Bootstrap UCL	98.92	95% Percentile Bootstrap UCL	41.15
95% BCA Bootstrap UCL	47.4		
90% Chebyshev(Mean, Sd) UCL	50.49	95% Chebyshev(Mean, Sd) UCL	60.77
97.5% Chebyshev(Mean, Sd) UCL	75.05	99% Chebyshev(Mean, Sd) UCL	103.1

Suggested UCL to Use

95% Chebyshev (Mean, Sd) UCL	60.77

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

Lognormal UCL Statistics for Uncensored Full Data Sets

User Selected Options

Date/Time of Computation	25/05/2018 15:50
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

Zinc

General Statistics

Total Number of Observations	38	Number of Distinct Observations	30
		Number of Missing Observations	0
Minimum	3	Mean	94.03
Maximum	690	Median	43
SD	133.8	Std. Error of Mean	21.71
Coefficient of Variation	1.423	Skewness	2.842

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.978	Shapiro Wilk Lognormal GOF Test	
5% Shapiro Wilk Critical Value	0.938	Data appear Lognormal at 5% Significance Level	
Lilliefors Test Statistic	0.0895	Lilliefors Lognormal GOF Test	
5% Lilliefors Critical Value	0.144	Data appear Lognormal at 5% Significance Level	
Data appear Lognormal at 5% Significance Level			

Lognormal Statistics

Minimum of Logged Data	1.099	Mean of logged Data	3.758
Maximum of Logged Data	6.537	SD of logged Data	1.314

Assuming Lognormal Distribution

95% H-UCL	185.5	90% Chebyshev (MVUE) UCL	175.7
95% Chebyshev (MVUE) UCL	211	97.5% Chebyshev (MVUE) UCL	260
99% Chebyshev (MVUE) UCL	356.2		

Nonparametric Distribution Free UCLs

95% CLT UCL	129.7	95% Jackknife UCL	130.6
95% Standard Bootstrap UCL	129.6	95% Bootstrap-t UCL	152.9
95% Hall's Bootstrap UCL	166.1	95% Percentile Bootstrap UCL	132.5
95% BCA Bootstrap UCL	142.6		
90% Chebyshev(Mean, Sd) UCL	159.1	95% Chebyshev(Mean, Sd) UCL	188.6
97.5% Chebyshev(Mean, Sd) UCL	229.6	99% Chebyshev(Mean, Sd) UCL	310

Suggested UCL to Use

95% H-UCL	185.5

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

ProUCL computes and outputs H-statistic based UCLs for historical reasons only.
H-statistic often results in unstable (both high and low) values of UCL95 as shown in examples in the Technical Guide.
It is therefore recommended to avoid the use of H-statistic based 95% UCLs.
Use of nonparametric methods are preferred to compute UCL95 for skewed data sets which do not follow a gamma distribution.

Nonparametric UCL Statistics for Uncensored Full Data Sets

User Selected Options

Date/Time of Computation	25/05/2018 15:52
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

BaP

General Statistics

Total Number of Observations	21	Number of Distinct Observations	3
		Number of Missing Observations	0
Minimum	0.5	Mean	0.529
Maximum	0.9	Median	0.5
SD	0.0956	Std. Error of Mean	0.0209
Coefficient of Variation	0.181	Skewness	3.53
Mean of logged Data	-0.649	SD of logged Data	0.145

Nonparametric Distribution Free UCL Statistics
Data do not follow a Discernible Distribution (0.05)

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	0.565	95% Adjusted-CLT UCL (Chen-1995)	0.58
		95% Modified-t UCL (Johnson-1978)	0.567

Nonparametric Distribution Free UCLs

95% CLT UCL	0.563	95% Jackknife UCL	0.565
95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A
95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A
95% BCA Bootstrap UCL	N/A		
90% Chebyshev(Mean, Sd) UCL	0.591	95% Chebyshev(Mean, Sd) UCL	0.62
97.5% Chebyshev(Mean, Sd) UCL	0.659	99% Chebyshev(Mean, Sd) UCL	0.736

Suggested UCL to Use

95% Student's-t UCL	0.565	or 95% Modified-t UCL	0.567

Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.
These recommendations are based upon the results of the simulation studies summarized in Singh, Singh, and Iaci (2002)
and Singh and Singh (2003). However, simulations results will not cover all Real World data sets.
For additional insight the user may want to consult a statistician.

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Document Status

Rev No.	Author	Reviewer	Approved for Issue		
		Name	Name	Signature	Date
0	Rohan Hammond	Greg Dasey	Greg Dasey		28 March 2018
1	Rohan Hammond	Greg Dasey	Greg Dasey		25 July 2018
2	Rohan Hammond	Greg Dasey	Greg Dasey		15 January 2109
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Appendix G Pre-Remediation Investigation 2020

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Penrith City Council
Penrith Central Park Village

DRAFT Pre-Remediation Investigation

134 to 144 Henry Street,
42 to 50 Station Street,
and Allen Place Car Park

8 December 2020

58140/131,749 Rev B

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Penrith City Council
Penrith Central Park Village

DRAFT Pre-Remediation Investigation

134 to 144 Henry Street,
42 to 50 Station Street,
and Allen Place Car Park

8 December 2020

58140/131,749 Rev B

JBS&G Australia Pty Ltd

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table of Contents

Abbreviations vi

Executive Summary vii

1. Introduction 9
   - 1.1 Background 9
   - 1.2 Objectives 9
   - 1.3 Proposed Development 9

2. Site Condition and Surrounding Environment 10
   - 2.1 Site Identification 10
   - 2.2 Site Description 10
     - 2.2.1 The Dry Cleaner, 134-138 Henry Street, Penrith 10
     - 2.2.2 Shop 3, 140 Henry Street, Penrith 10
   - 2.3 Surrounding Land Use 11
   - 2.4 Topography 11
   - 2.5 Geology and Soils 11
   - 2.6 Salinity 12
   - 2.7 Hydrology 12
   - 2.8 Hydrogeology 13
   - 2.9 Acid Sulfate Soils 13
   - 2.10 Meteorology 13

3. Conceptual Site Model 14
   - 3.1 Overview 14
   - 3.2 Potentially and Contaminated Media 14
     - 3.2.1 AEC 1 Former Dry Cleaner 14
   - 3.3 Potential for Migration 17
   - 3.4 Potential Exposure Pathways 18
     - 3.4.1 On-site Recreational Public Open Spaces 18
     - 3.4.2 Offsite Exposure Pathways 18
   - 3.5 Receptors 19
   - 3.6 Preferential Pathways 19

4. Data Gaps 20

5. Sampling and Analysis Plan 21
   - 5.1 Data Quality Objectives 21
     - 5.1.1 State the Problem 21
     - 5.1.2 Identify the Decision 21
     - 5.1.3 Identify Inputs to the Decision 21
     - 5.1.4 Define the Study Boundary 21

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5.1.5 Develop a Decision Rule 22
5.1.6 Specify the Limits on Decision Error 22
5.1.7 Optimise the Design for Obtaining the Data 24
5.2.1 Sub-Slab Vapour Probe Installation 25
5.2.2 Soil Vapour Probe Installation 25
5.2.3 Soil Vapour Probe / Sub-slab Sampling and Analysis 25
5.3 Soil Assessment 26
5.4 Analytical Schedule 26
6. Assessment Criteria 28
6.1.1 Vapour Assessment Criteria 28
6.1.2 Leachability Assessment 28
6.1.3 Waste Classification Assessment 28
7. Quality Assurance / Quality Control 29
8. Vapour Assessment 30
8.1 Field Observations 30
8.2 Summary of Results 30
8.2.1 Sub-slab Vapour 30
8.2.2 Soil Vapour 31
9. Soil Assessment 32
9.1 Field Observations 32
9.2 Analytical Results 32
9.2.1 Total VOCs 32
9.2.2 Leachability of VOCs 32
9.2.3 Preliminary Waste Classification 32
10. Site Characterisation 33
10.1 Have the identified site-related contaminants (chlorinated ethenes) acting as potential source material been appropriately and sufficiently delineated? 33
10.2 Can a preliminary waste classification be provided for materials that may require off-site disposal during remediation activities? 33
10.3 Are there any impacts of chemical mixtures? 34
10.4 Is further assessment required (i.e. is there enough information to prepare a detailed RWP for the development area)? 34
11. Conclusions 35
12. Limitations 36

List of Tables

Table 2.1: Summary Site Details 10

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 6.1 Areas of Environmental Concern and associated Contaminants of Potential Concern 14
Table 3.2: Indoor Air and Sub-Slab VOC Concentrations 17
Table 3.3: PCE to TCE Ratio in Site Media 17
Table 5.1: Summary of Decision Rules 22
Table 5.2: Summary of DQIs 23
Table 5.3: Analytical Schedule 27
Table 8.1: Summary of Field Measured Vapours / Gases at Sub-slab and Soil Vapour Probes 30

List of Figures

Figure 1 Site Location
Figure 2 Site Layout
Figure 3 Site Layout and Areas of Environmental Concern
Figure 4A Historical Soil Sample Locations and Tier 1 Exceedances
Figure 4B Groundwater Well Locations, Tier 1 Exceedances and Inferred Groundwater Flow Direction
Figure 4C Soil Vapour Sample Locations and Tier 1 Exceedances
Figure 4D 134-138 and 140 Henry Street Floor Plan and Vapour Sample Locations
Figure 5 Sample Locations

Appendices

Appendix A Summary Analytical Tables
Appendix B Borelogs
Appendix C Design Plans
Appendix D Field Calibration Sheets
Appendix E Laboratory Reports and Chain of Custody Documentation

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Abbreviations

Term	Definition
ACM	Asbestos Containing Material
AEC	Area of Environmental Concern
AHD	Australian Height Datum
ASLP	Australian Standard Leaching Procedure
ASS	Acid Sulfate Soils
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CE	chlorinated ethene
CEC	Cation Exchange Capacity
COPC	Contaminants of Potential Concern
Council	Penrith City Council
CSM	Conceptual Site Model
DA	Development application
DCE	Dichloroethylene
DGI	Data Gap Investigation
DO	Dissolved Oxygen
DP	Deposited Plan
DPI	Department of Primary Industry
DQI	Data Quality Indicator
DQO	Data Quality Objective
EC	Electrical Conductivity
Eh	Redox Potential
EIL	Ecological Investigation Levels
EPA	NSW Environment Protection Authority
ESL	Ecological Screening Levels
GPS	Global Positioning Unit
GSW	General Solid Waste
ha	Hectare
HIL	Health Investigation Levels
HSL	Health Screening Levels
JBS&G	JBS&G Australia Pty Ltd
LEP	Local Environmental Plan
LOR	Limit of Reporting
NATA	National Association of Testing Authorities
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measure
PAH	Polycyclic Aromatic Hydrocarbons
PARCCS	Precision, Accuracy, Representativeness, Comparability, Completeness and Sensitivity
PCB	Polychlorinated Biphenyls
PCE	Tetrachloroethylene
PCPV	Penrith City Village Park
pH	Potential of Hydrogen
PID	Photo-ionisation Detector
ppm	Parts Per Million
QA/QC	Quality Assurance / Quality Control
RAP	Remedial Action Plan
RL	Relative Level
RPD	Relative Percent Difference
RWP	Remedial Works Plan
SAQP	Sampling Analysis Quality Plan
SWL	Standing Water Level
TCE	Trichloroethylene
TCLP	Toxicity Contaminant Leaching Procedure
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
VOC	Volatile Organic Compounds

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Executive Summary

JBS&G Australia Pty Ltd (JBS&G) has been engaged by Penrith City Council (Penrith, the client) to provide environmental consultancy services associated with the proposed redevelopment of the Penrith City Village Park (PCPV). It is understood that the client is proposing to develop the western portion of PCPV (herein, referred to as the 'site') for contemporary public open space.

Historical investigations identified potential areas of environmental concern (AEC), including chlorinated ethene (CE) impacts underlying the former dry cleaner located at Shop 3 Gaymark Lane (herein referred to as AEC1) that requires remediation prior to the redevelopment of the site. As such, the objectives of this investigation were to refine the extent of soil remediation works as related to CE impacts (at AEC 1) to facilitate remedial works planning. It is noted that JBS&G (2020[1]) prepared a Sampling, Analysis and Quality Plan (SAQP) detailing the sampling required and methods to be used for undertaking the pre-remediation investigation, however due to tenants still occupying a significant portion of the commercial spaces within AEC1, not all the sampling could be completed in accordance with the SAQP. As such, additional assessment (prior to remediation works) in accordance with the SAQP, will be required to further refine the extent of CE impacts at AEC1 that will require remediation. The results detailed herein have been presented to facilitate remedial works planning.

Based on the data presented herein and subject to the limitations presented in **Section 12**, the following conclusions are made:

- Consistent with historical investigations, elevated levels of tetrachloroethylene (PCE) and trichloroethylene (TCE) were reported in sub-slab vapour at sample locations underlying Shop 3 Gaymark Lane (as represented by SS01 to SS09). Conversely, the levels of TCE and PCE within samples at locations within the western portion of AEC1 (SV12 to SV18) were below laboratory detection limits, providing evidence that soil vapour has not migrated to this lateral extent. On this basis, the inferred lateral extent of CE impacted soils acting as potential source material (to soil vapour) and requiring remediation has been refined to an area of approximately 650 m^2 as shown on **Figure 5**. Additional assessment, as outlined herein will likely further refine this inferred lateral remediation extent.
- To inform the likely depth of CE source material, JBS&G installed soil vapour probes at depths of 1 m and 4 m at locations SV10 and SV11. At both locations, elevated levels of TCE and PCE were detected in the shallow probe (1 m) but below detection limits in the deeper probes (4 m). This data provides evidence that the low permeability clay soils at the site have retarded the vertical migration of these impacts at the site. This is concordant with the visually observed depth of more permeable fill material overlying residual clays and the detection of PCE within the shallow soil sample SV11 0.2-0.3 (2.2 mg/kg) that was in turn, reported at below detection limits in all underlying soil samples. Additional assessment, as outlined herein will likely further refine this inferred vertical remediation extent.
- The leachable concentration (via Australian Standard Leaching Procedure, ASLP) of all VOCs in each soil sample selected for analysis (including SV11 0.2-0.3) were below the laboratory LOR, indicating the CE impacts at AEC1 appear to be largely non-leachable at the locations assessed and therefore unlikely to present an on-going risk to groundwater.
- Based on the total contaminant concentrations and leachable concentrations (via toxicity characteristic leaching procedure, TCLP) within samples collected from in-situ materials assessed herein and comparison to NSW EPA (2014) assessment criteria identified that the

[1] *Pre-Remediation Investigation, Sampling Analysis and Quality Plan*, 134 to 144 Henry Street, 42 to 50 Station Street and Allen Place Car Park, JBS&G Australia Pty Ltd, 1 May 2020 (JBS&G 2020).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

fill based soils at the site are largely consistent with a preliminary waste classification of General Solid Waste (GSW).

- Additional assessment is required to further refine the lateral and vertical extent of source materials within AEC1 that will require remediation. In addition, the additional investigations will require to assess the extent of CE impacts within underground service trenches within AEC1, where the former site operator potentially disposed of dry-cleaning fluids that historically caused environmental impacts (potentially to depth). The additional investigations are proposed to be completed when the commercial tenants (within the area of AEC1) vacate the properties prior to remediation works.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1. Introduction

1.1 Background

JBS&G Australia Pty Ltd (JBS&G) has been engaged by Penrith City Council (Penrith, the client) to provide environmental consultancy services associated with the proposed redevelopment of the Penrith City Village Park (PCPV). It is understood that the client is proposing to develop the western portion of PCPV (herein, referred to as the 'site') for contemporary public open space. The site area is shown on **Figures 1** and **2.** In addition, the address and legal identification of each property within the site is provided in **Table 2.1**.

Historical investigations identified potential areas of environmental concern (AEC), including chlorinated ethene (CE) impacts underlying the former dry cleaner located at Shop 3 Gaymark Lane (herein referred to as AEC1) that requires remediation prior to the redevelopment of the site. An overarching Remedial Action Plan (RAP) (JBS&G 2019a[2]) for the whole PCPV site was previously prepared to facilitate feasibility planning and costing for the overall development. Upon development of detailed design plans and establishment of project staging, detailed Remedial Works Plans (RWPs) were intended to be prepared to facilitate the staged remediation of specific portions of the PCPV site.

The RAP (JBS&G 2019a) identifies that soil, groundwater and soil vapour in the area of the former dry cleaner (134-138 Henry Street) is contaminated with chlorinated ethenes (principally trichloroethylene (TCE) and tetrachloroethylene (PCE)). The RAP (JBS&G 2019a) further identifies the preferred remediation methodologies for the identified impacts within Shop 3 Gaymark Lane (referred to as AEC1) – comprising either excavation and off-site disposal or on-site treatment of the impacted soils. However, given that only limited sampling has previously occurred in this portion of the site, the required remedial extent has previously not been defined.

The RAP (JBS&G 2019a) provides the requirement for a pre-remediation investigation to allow collection of data on a scale consistent with the proposed land-use, refine the remediation extent, and facilitate the selection of the preferred ex-situ soil treatment technology or off-site disposal requirements. JBS&G (2020[3]) prepared a Sampling, Analysis and Quality Plan (SAQP) detailing the sampling required and methods to be used for undertaking the pre-remediation investigation.

This investigation was undertaken generally in accordance with NSW EPA published or endorsed guidelines.

1.2 Objectives

The objectives of the investigation were to refine the extent of soil remediation works as related to CE impacts (at AEC 1) to facilitate works planning in accordance with the RAP (JBS&G 2019a).

1.3 Proposed Development

Review of the design plans (**Appendix C**) indicate that the site will comprise a large open recreational space. The park is envisaged to comprise a mixture of paved and grassed areas including shallow/deep planted gardens and water features. Importantly, there will be no enclosed structures with the exception of the amenities building located in the south-eastern portion of the site which will contain toilets, change and storage rooms.

[2] *Overarching Remedial Action Plan*, Penrith Central Park Village, 114 to 146 Henry Street, 42 to 50 Station Street and Allen Place Car Park, JBS&G Australia Pty Ltd, 5 March 2019 (JBS&G 2019a).

[3] *Pre-Remediation Investigation, Sampling Analysis and Quality Plan*, 134 to 144 Henry Street, 42 to 50 Station Street and Allen Place Car Park, JBS&G Australia Pty Ltd, 1 May 2020 (JBS&G 2020).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2. Site Condition and Surrounding Environment

2.1 Site Identification

The site location is shown on **Figure 1**. The extent of the site and associated cadastral boundaries are shown on **Figure 2**. The site details are summarised in **Table 2.1** and described in detail in the following sections.

Table 2.1: Summary Site Details

Property Identification and Street Addresses	The site is comprised of the following legal properties: • Lot 1 in DP 164798 – 134 to 138 Henry Street • Lot 10 and 11 in DP 553665 – 140 to 142 Henry Street • Lot 2 in DP 556075 – 144 Henry Street • Lot 3 in DP1200790 – 42 to 44 Station Street • Lot 1 in DP 526304 – 48 to 50 Station Street • Lot E in DP 163176 – 46 Station Street In addition, the site area includes portions of the Allen Place Car Park.
Local Government Authority	Penrith City Council
Approximate MGA Coordinates (MGA 56)	Easting: 286582.2 Northing: 6262912.7
Site Zoning	Commercial Core (B3) and Public Recreation (RE1) under Penrith Local Environmental Plan (LEP) 2010
Current Use	Commercial (car parking, retail and services)
Previous Use	Commercial/industrial (car parking, dry cleaning and general retail/services) and residential
Proposed Use	Public open space
Site Area	Approximately 0.71 ha

2.2 Site Description

The key features from the areas that form the focus of this pre-remediation investigation are discussed in the following sections and shown on **Figure 2**. Observations were made by an experienced JBS&G consultant on 18 May 2020 during an inspection of accessible areas of the site.

2.2.1 The Dry Cleaner, 134-138 Henry Street, Penrith

The former dry cleaner comprised the northern third of the building (referred to as Shop 3, Gaymark Lane) located at 134-138 Henry Street, Penrith. The shop-front occupied most of the building footprint (>85 %), with the remainder comprising a secluded water closet, storage space and point of sale. The premise was vacant during the period of the investigation.

The water closet comprised a small (<3 m^2), fully enclosed space which was serviced by two separate sewerage disposal points. Detergents, household solvents and soaps were observed to be stored within the water closet. The shop-front was serviced by an air exchange (air-conditioning) unit which was observed to be operational during each visit to the premises.

In the alleyway between the dry cleaner and Shop 3 (140 Henry Street, described below), numerous services were present (as shown on **Figure 4d**). Sewerage infrastructure and stormwater pipes ran in a north to south orientation, connecting stormwater and sewerage pipes to the greater system, south of the premises. Services were noted to comprise a mixture of terracotta and polyvinyl chloride (PVC) pipes.

The southern portion of 134-138 Henry Street was inaccessible during the period of the investigation, in which it is noted a café was operating.

2.2.2 Shop 3, 140 Henry Street, Penrith

None of the building spaces located on 140 Henry Street were accessible during the period of the investigation due to business/tenants still operating. Therefore, the observations described below

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

are based on an inspection by a suitably qualified and experienced JBS&G environmental consultant conducted on 3 May 2018 and detailed in the RAP (JBS&G 2019a).

Shop 3 comprised the southern half of the building located at 140 Henry Street, Penrith. The shop was partitioned into four rooms and a water closet, joined by a central hallway. The premises housed an alternative health centre at the time of the inspection.

The shop-front rooms were serviced by air exchange units (air conditioners) which were observed to be in operation during each site visit. The water closet comprised a small (<5 m^2), fully enclosed space which was serviced by two separate sewerage disposal points.

An inspection of the property revealed the presence of household cleaning and medical products: limescale solvents, surface cleaners, stain removers, methylated spirits, polishes, pest control products, ethanol-based surface wipes and carpet deodorisers.

2.3 Surrounding Land Use

The land uses of adjacent properties or properties across adjacent roads at the time of inspection are summarised below.

- North – The site is bound to the north by Henry Street and then numerous commercial premises including UFC Gym, Queens of Hearts Community Foundation and Nepean College. Further north is an open carpark and commercial premises on Belmore Street, including Bob Jane T-Marts and a veterinary hospital;
- East – To the east of the subject site is the remaining PCPV area comprising Gaymark Lane and commercial properties beyond. It is noted that a former service station is located directly east of Gaymark Lane in which the RAP (JBS&G 2019a) identifies that as an area of environmental concern (AEC);
- South – The site is was bound to the south by Allen Place, following which are multiple commercial properties including cafes, a medical centre and pharmacy. Beyond High Street commercial premises are present; and
- West – The site is bound to the west by Station Street, then medium to high density commercial premises. Further to the west is Peach Tree Creek and eventually the Nepean River.

2.4 Topography

Review of topographic information obtained from the Spatial Information Exchange Viewer, LPI (2015[4]) regional topographic map indicated that the site surfaces have an elevation of approximately 30 m Australian Height Datum (AHD). The site generally slopes downwards to the west, towards the Nepean River.

Site inspection confirmed that the topography on site was not significantly altered from the natural alignment and sloped slightly downward toward the western boundary, Station Street. A local ridge line existed which dissected the Allen Place Car Park in an approximately west to east alignment, with site surfaces sloping downwards perpendicular to the ridge line.

2.5 Geology and Soils

Reference to the 1:100 000 Geological Series Sheet for Penrith, DMR (1991[5]) indicates that the site is underlain by Bringelly Shale of the Wianamatta Group originating from the Middle Triassic epoch. This unit is comprised of shale, carbonaceous claystone, claystone, laminite, fine to medium-grained

[4] *'Spatial Information Exchange Viewer'*, NSW Land and Property Information, Accessed 4 January 2018, https://maps.six.nsw.gov.au/;
[5] '*Penrith 1:100 000 Geological Series Sheet 9030 (Edition 1)'.* Department of Mineral Resources, 1991, DMR (1991);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

lithic sandstone, rare coal and tuff. Bringelly Shale is underlain by Ashfield Shale and, at depth, Hawkesbury Sandstone.

Reference to the 1:100 000 Soil Landscape Series Sheet for Penrith, DMR (1990[6]) indicates that the site is within the Richmond Soil Landscape group. This group of landscape is characterised by quaternary terraces of the Nepean and Georges Rivers. Relatively flat (slopes <1 %) and level. Splays, levees provide local relief of <3 m. Formerly a low open woodland. Richmond soils are poorly structured orange to red clay loams, clays and sands. Texture may increase with depth. Ironstone nodules may be present. Plastic clays in drainage lines, red earths and red podzolic soils occur on terrace surfaces with earthy sands on terrace edges. Limitations of the Richmond group include high erosion hazard on terrace edges and minor localised flooding.

The lithology observed during previous investigations (PSM 2017[7], JBS&G 2017a[8] and 2019b[9]) is as follows:

- Shallow to moderately deep alluvial soils comprising clay to sandy clay (present from a depth of 0.4 m to 10.5 m below ground surface (bgs));
- Moderately deep to deep alluvial clay to sandy clay mixed with Nepean River gravels (present from a depth of 6.1 m to 13.0 m bgs); then
- Residual shale bedrock (present from a depth of 13.0 m to 15.0 m bgs).

2.6 Salinity

Reference to the Department of Infrastructure, Planning and Natural Resources salinity potential map GS912, DIPNR (2002[10]), has indicated that the site exists within an area of 'moderate salinity potential'.

Vegetation at the site during the site inspection did not exhibit any indicators of salinity related stress.

2.7 Hydrology

Rainfall is considered likely to migrate primarily through surface water runoff into the municipal stormwater system. Minor infiltration into the underlying porous soils and surface is also expected in areas of unsealed ground.

As discussed in **Section 2.2**, the site is largely covered by concrete, asphaltic pavements and building footprints. As such, surface water generated during periods of rainfall is anticipated to primarily enter the municipal stormwater system; via discharge into onsite stormwater catchment infrastructure or alternatively discharge into stormwater pits within the surrounding roadways.

The nearest water body to the Site is Peach Tree Creek, approximately 1.1 km to the west of the site boundary. Peach Tree Creek ultimately contributes to the Nepean River. Municipal stormwater discharges to the Nepean River.

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6 *'Penrith 1:100 000 Soil Landscape Series Sheet 9030'*. Department of Mineral resources, 1990, DMR (1990);

7 *'Central Park Village, Penrith Geotechnical Investigation*'. Pells Sullivan Meynink, 2017, PSM (2017).

8 *Phase 2 Environmental Site Assessment* – 114 to 146 Henry Street, 42 to 50 Station Street and Allen Place Car Park, Penrith, NSW. JBS&G Australia Pty Ltd, Reference 52372/113034, 9 July 2017, JBS&G (2017a).

9 *Data Gap Investigation* – 114 to 146 Henry Street, 42 to 50 Station Street and Allen Place Car Park. JBS&G Australia Pty Ltd, Reference 52372/113024, 15 January 2019, JBS&G (2019b).

10 *'Salinity Potential In Western Sydney 2002 – GS912'*. Department of Infrastructure, Planning and Natural Resources, March 2003, DIPNR (2002).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2.8 Hydrogeology

Registered groundwater bore information was obtained from the NSW Department of Primary Industries groundwater mapping tools, NSW DPI (2016[11]). A review of the registered bore information indicated that there were thirteen bores within a 1.5 km radius of the Site. Based on the reported geology, topography and depth to groundwater, groundwater migration is expected to occur in a north-westerly direction, towards Peach Tree Creek approximately 1.2 km away. Groundwater has been reported in the surrounding properties within the river gravels layer. The DGI (JBS&G 2019b) reported groundwater depths ranging from 6.96 m to 8.05 m bgs, flowing in a north-westerly direction.

Registered groundwater bores located within a 1.5 km radius of the site are used for monitoring, recreational and testing purposes. Given the relatively dense urban use of the site and surrounding properties, in addition to the identified licensed bores, there is a moderate probability of additional undocumented bores near the site. No reported utilisation of groundwater as a drinking water source has been reported.

2.9 Acid Sulfate Soils

The Guidelines for the Use of Acid Sulfate Soil Risk Maps, Department of Land and Water Conservation (DLWC) (1997[12]), has indicated that acid sulfate soils (ASS) are likely to be located in coastal lowlands up to about 10 m AHD. No risk map for the area encompassing the site was provided as part of the acid sulfate soil risk map series, DLWC (1998). Review of the geographical and topographical location of the site has indicated that it is a significant distance away from tidal creeks or estuaries, and it is considered unlikely that ASS would exist at the site.

Three planning certificates were obtained for the site, provided in the DSI (JBS&G 2017a). The land was not identified to have been affected by a policy adopted by Council or adopted by any other public authority, notified to Council, that restricts the development of the land because of the likelihood of ASS.

No staining, odours or other indicators of ASS were observed during the DSI or DGI (JBS&G 2017a and 2019b).

2.10 Meteorology

A review of average climatic data for the nearest Bureau of Meteorology monitoring location (Penrith Lakes[13]) indicates the site is located within the following meteorological setting:

- Average minimum temperatures vary from 5.5 ^{o}C in July to 18.5 ^{o}C in January;
- Average maximum temperatures vary from 17.7 ^{o}C in July to 30.7 ^{o}C in January;
- The average annual rainfall is approximately 728.1 mm with rainfall greater than 1 mm occurring on an average of 71.7 days per year; and
- Monthly rainfall varies from 30.6 mm in September to 121.4 mm in June with the wettest periods occurring on average in January to June.

[11] NSW Department of Primary Industries, 2015. Groundwater Monitoring Overview Map. Http://allwaterdata.water.nsw.gov.au/water.stm. Accessed 8 November 2016.

[12] '*Guidelines for the use of Acid Sulfate Soil Risk Maps, Edition 2'*, 1998, Ref: ISBN 0 7347 5134 6, NSW DLWC (1998).

[13] http://www.bom.gov.au/climate/averages/tables/cw_067113.shtml, Commonwealth of Australia, 2013 Bureau of Meteorology, Product IDCJCM0028 prepared on 1 November 2016 and accessed by JBS&G on 8 November 2016.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3. Conceptual Site Model

Given that this pre-remediation investigation is largely focussed on addressing AEC 1 (as discussed in **Section 5**), the CSM presented below largely focusses on this portion of the subject site.

3.1 Overview

NEPC (2013) identifies a CSM as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The development of a CSM is an essential part of all site assessments.

NEPC (2013) identified the essential elements of a CSM as including:

- Known and potential sources of contamination and contaminants of concern including the mechanism(s) of contamination;
- Potentially affected media (soil, sediment, groundwater, vapours etc.);
- Human and ecological receptors;
- Potential and complete exposure pathways; and
- Any potential preferential pathways for vapour migration (if potential for vapours identified).

3.2 Potentially and Contaminated Media

Areas of environmental concern for the subject site are shown on **Figure 3**. Potential and known contaminated media comprise:

- Fill materials;
- Underlying natural soils;
- Subsurface vapour and ground gases; and
- Groundwater

Table 6.1 Areas of Environmental Concern and associated Contaminants of Potential Concern

Areas of Environmental Concern (AEC)	Contamination Status	Potentially Contaminated Media	Contaminants of Potential Concern (COPC)
AEC 1 – Former Dry Cleaner 134-138 Henry Street (Lot 1 DP164798) Improper disposal/management of dry-cleaning chemicals	Known	Soil, groundwater, soil-vapour and indoor air	Chlorinated Ethenes (PCE, TCE, DCE)
AEC 3 – Transformers Historical spillage/leakage of transformer oils underlying transformers within the Allen Place carpark.	Potential	Soils	TRHs and PCBs
AEC 4 – Fill material Underlying Buildings Fill materials of unknown origin used for site levelling and activities associated with development. Application of COPCs as a result of general maintenance during site occupation (pesticides, herbicides, fuel and oil spills etc).	Potential	soils	Heavy metals, PAHs, TRH, BTEX, OCPs, PCBs, VOCs and asbestos

3.2.1 AEC 1 Former Dry Cleaner

Soil, soil vapour and groundwater samples obtained during the DSI (JBS&G 2017a) and DGI (JBS&G 2019a) indicate that the greatest levels of CE impact is in the immediate vicinity 134-138 Henry

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Street and extending north and west of the premises. Detections of contaminant concentrations a considerable distance west of the premises provide evidence that the compounds may have migrated along the inferred sewerage infrastructure alignment. Impacts to site media are detailed in **Section 3.2.1.1** to **Section 3.2.1.4** and previous sampling locations are presented in **Figures 4a** (soil), **4b** (groundwater) and **4c** (soil vapour).

3.2.1.1 Soil Impacts

Soil samples analysed as part of the previous (JBS&G 2017a) and DGI (JBS&G 2019a) have not identified gross and/or widespread soil contamination. No soil samples analysed within the groundwater table, or nearby to sewerage infrastructure were reported to contain COPCs above the laboratory limit of reporting (LOR). Minor concentrations of PCE and TCE at location JHA04, underlying Shop 3/140 Henry Street, were reported in JBS&G (2017a).

Notwithstanding, it is considered likely that soils surrounding the sewerage infrastructure, and underlying the dry cleaner, have historically been impacted by dry cleaning solvents. The maximum levels of TCE reported in sub slab vapour are consistent with a source of chlorinated ethene being present in the unsaturated zone. Chlorinated ethenes can commonly be heterogeneously distributed through a soil profile, and localised within the extent of a sample of soil collected in clay based soils. Due to their characteristics subsurface chlorinated ethene impacted soils are not typically readily identified. Impacted soils are considered to potentially represent an ongoing source of contamination to both groundwater and soil vapour.

3.2.1.2 Groundwater Impacts

Groundwater analytical results indicated that PCE was present at concentrations exceeding the investigation criterion at JBMW02 and JBMW05, and above the laboratory LOR in JBMW03, PSM01 and PSM03. Chlorinated ethenes were not detected in samples of groundwater collected from JBMW01, JBMW04, JBMW06, JBMW07 or PSM02. Trace concentrations of TCE in groundwater were reported at locations JBMW02 (0.002 mg/L to 0.009 mg/L), JBMW05 (0.002 mg/L) and PSM01 (0.001 mg/L).

It is noted that JBMW02 and JBMW05 are over the northern boundary of the site, providing evidence that the impact has migrated off the site via the groundwater. No groundwater monitoring wells have been installed directly into the chlorinated ethene impact source zone, although it is considered likely that the highest concentrations of chlorinated ethenes will be present directly underneath the dry cleaner.

Impacts to groundwater have been delineated north (JBMW06 and JBMW07), east (JBMW03), south (PSM02) and west (JBMW01 and JBMW04). Potential remains for groundwater impact to be present further northwest of JBMW05.

3.2.1.3 Soil vapour Impacts

<u>Shallow Soil Vapour</u>

Results obtained from the DGI (JBS&G 2019a) have shown that significant concentrations of PCE and TCE are present within shallow soil vapour (<0.3 m bgl) surrounding the dry cleaner. Soil vapour contaminant samples collected from locations SV11, SV14 and SV16 were reported to have concentrations of CEs above the laboratory LOR. The highest results reported during the current assessment were associated with location SV14, which was placed immediately overlying sewerage infrastructure servicing the dry cleaner. Soil vapour samples collected from locations SV12, SV13, SV15 and SV17 were not reported to have any VOCs above the laboratory LOR.

Within samples where both TCE and PCE were detected above the laboratory LOR, the ratio of PCE/TCE ranged from 4.143 to 14.49.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

The distribution of CEs in soil vapour has provided evidence that the compounds have migrated within/alongside the sewerage infrastructure a considerable distance from the dry cleaner (>50 m). In addition, impacted soil vapour may be migrating over the northern boundary of the site, as indicated by elevated concentrations in SV11.

The investigation results indicate that the occurrence of CEs in shallow soil-vapour is not strongly correlated with presence in groundwater. Whilst volatilisation of CEs from groundwater is likely to be occurring, it is considered unlikely that it is occurring at a level which represents a risk to future site users on the basis of the following considerations.

- SV09 contained no soil vapour concentrations above the laboratory LOR with elevated underlying groundwater impact (PSM01, 0.033 mg/L to 0.059 mg/L);
- The largest groundwater impact (JBMW02) was near two soil-vapour sample locations which were reported to contain minimal concentrations (SV11) to no detection (SV12) of CEs in soil-vapour were present;
- SV16 contained elevated concentrations of CEs with no underlying groundwater impact (JBMW04), and the highest reported soil vapour impact is overlying adjacent to the sewerage infrastructure (SV14); and
- Groundwater is in excess of 7 m below the current ground surface.

Deep Soil Vapour

Two deep soil vapour samples were taken north of the former dry cleaner (SV18 and SV19). Samples were collected from 4.7 m to 5.0 m below ground levels. Highly elevated CEs were detected in both samples, exceeding interim HILs:

- SV18: PCE (367 mg/m^3) and TCE 1.62 (mg/m^3); and
- SV19: PCE (1300 mg/m^3) and TCE 8.83 (mg/m^3).

These results are indicative of the presence of contamination at beneath/adjacent to the former dry cleaners at depth. The relatively low concentrations in groundwater indicate that the deep source is unlikely to be present in the saturated zone. Additional assessment will be required to determine the extent of remediation required to address the presence of elevated CE in deep offsite soil vapour.

3.2.1.4 Indoor Air

Indoor air was sampled over four monitoring events (9 and 17 April 2018, 3 May 2018 and 15 November 2018). Samples analysed from Shop 3/134-138 Henry Street and Shop 3/140 Henry Street have indicated that the PCE is present within the indoor air of both premises. TCE was generally not detected above the laboratory limit of reporting in the analysed samples, with the notable exception of 140_SHOP on 9 April and 3 May 2018. **Table 3.2** and **Table 3.3** show ratios of indoor air to sub-slab vapour concentrations, and relative PCE to TCE concentrations within samples.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 3.2: Indoor Air and Sub-Slab VOC Concentrations

Sample Location	Highest Indoor Air Concentration (µg/m³)	Closest Sub-Slab Soil Vapour Concentration (µg/m³)	Indoor Air to Sub-slab Soil Vapour Ratio
Tetrachloroethene			
140_BATH	<3	14 500 (SV10)	<0.00021
140_SHOP	5	14 500 (SV10)	0.00035
DC_BATH	8	40 000 (SV14)	0.00020
DC_SHOP	8	40 000 (SV14)	0.00020
Trichloroethene			
140_BATH	<2.7	3500 (SV10)	<0.00077
140_SHOP	20	3500 (SV10)	0.00571
DC_BATH	<2.7	2760 (SV14)	<0.00098
DC_SHOP	<2.7	2760 (SV14)	<0.00098

Table 3.3: PCE to TCE Ratio in Site Media

Sample Location	Highest PCE Concentration (µg/m³)	Highest TCE Concentration (µg/m³)	Ratio of PCE/TCE	Approximate Distance From Shop 3/140 Henry Street / Distance From Shop 3/134-138 Henry Street (m)
Indoor Air				
140_BATH	<3	<2.7	-	Internal
140_SHOP	5	20	0.250	Internal
DC_BATH	8	<2.7	>2.963	Internal
DC_SHOP	8	<2.7	>2.963	Internal
Sub-Slab				
SV05	56 667	9333	6.072	<5 / 20
SV10	14 500	3500	4.143	Underlying / 15
SV14	40 000	2760	14.49	Boundary / < 5
SV16	1520	168	9.047	30 / 40

One reported concentration of TCE within indoor air sample 140_SHOP, 9 April 2018 (20 µg/m³), was inconsistent with the subsequent three samples taken at the same location, 17 April 2018 (<2.7 µg/m3),3 May 2018 (5 µg/m³) and 15 November 2018 (<2.7 µg/m³).

The ratio between TCE and PCE in this indoor sample was significantly different to all sub-slab soil vapour samples in which both TCE and PCE were detected. On this basis, the elevated concentration is considered likely to be the result of an additional, internal source within the premises, and is not considered to be reflective of CE advection from the sub-slab soil vapour.

3.3 Potential for Migration

Contaminants generally migrate from site via a combination of windblown dusts, rainwater infiltration, groundwater migration and surface water runoff. The potential for contaminants to migrate is a combination of:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- The nature of the contaminants (solid/liquid and mobility characteristics);
- The extent of the contaminants (isolated or widespread);
- The location of the contaminants (surface soils or at depth); and
- The site topography, geology, hydrology and hydrogeology.

The contaminants of concern identified in JBS&G (2017, 2019a and 2019b) are generally in solid (e.g. asbestos, metals and PAHs), liquid (e.g. VOCs, TPH and BTEX) or gaseous (e.g. VOCs, BTEX, Volatile TRH) form.

As the ground surfaces across the current site layout primarily comprise sealed asphalt or concrete pavements and building footprints, the potential for windblown dust migration of contamination is generally low. The potential for contamination migration via surface water movement and infiltration of water and subsequent migration through the soil profile is considered generally to be low given the extent of impermeable pavements across the site. However, it is noted that during redevelopment of the site for public open space, these migration routes will become a possibility and require consideration in the context of the required remediation (discussed further in **Section 6**).

The underlying natural soils at the site comprise primarily clayey soils and are relatively impermeable. Notwithstanding, CEs have been detected within groundwater (PSM01, JBMW02 and JBMW05). On this basis, migration of contaminants via groundwater movement has been identified at the site.

Analysis of soil-vapour samples collected from shallow soils show that shallow soil vapour impacts are generally limited to 134-138 and 140 Henry Street. Deep soil-vapour samples collected on the northern side of Henry Street indicate that soil vapour impacts are present at depth beyond the northern site boundary. The scale of the impacts and generally low concentrations in groundwater imply the potential for a deep source of CEs in unsaturated horizons of soil potentially underlying Henry Street. Offsite vapour generation and transport is identified as a migration pathway.

3.4 Potential Exposure Pathways

Based on the COPC identified in various media, as discussed above, and proposed development activities, the exposure pathways for the site during and following development works are discussed below.

3.4.1 On-site Recreational Public Open Spaces

Recreational public open spaces comprise areas which will not be used for building development (**Figure 2**) and will cover the site extent. The following exposure pathways are relevant for site receptors within public open spaces:

- Potential dermal and oral contact to impacted soils as present at shallow depths and/or accessible by future service excavations; and/or
- Potential oral and dermal contact to groundwater as accessible by potential future service installation; and/or
- Inhalation of COPC vapours/gases/fibres migrating upwards from current *in-situ* soils/groundwater; and/or
- Potential contaminant uptake by vegetation proposed to be established in the vegetated areas of the site.

3.4.2 Offsite Exposure Pathways

Potential offsite receptors of deep soil vapour impact are identified as basement occupants of 121 Henry Street, Penrith. Potential exposure is through advection of vapours from impacted

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

soils/groundwater into the basement and inhalation by basement occupants. JBS&G (2019b) presents a vapour intrusion assessment, based on current site conditions, which indicates that no unacceptable concentrations of contaminants have been identified in indoor air within the basement of 121 Henry Street.

In the context of the PCPV development, future offsite receptors of soil vapour impact will be those within buildings/basements located within 30 m to the east of the identified impacts of AEC1. Noting that no detailed design plans have been provided for this portion of the PCPV development, the final on-site remedial extent (defined by this pre-remediation investigation) will be required to be cognisant of this potential exposure pathway and its potential implications for future basements/buildings in close proximity to the site.

The DGI provides a discussion of dilution/attenuation of contaminants within groundwater prior to discharge to the receiving water body (Peach Tree Creek), contaminant uptake by sensitive ecological receptors within the water body is considered not to be a potential exposure pathway which warrants further consideration.

Given the character of the groundwater, and the absence of identified groundwater bores within the vicinity of/downgradient of the site, potential beneficial reuse of the groundwater is not anticipated. Additionally, it is noted that groundwater is present at considerable depth below the current ground surfaces (7 to 8 m bgs). However, it has been conservatively assumed that groundwater may be intercepted by during construction of future basements within the residential/commercial precinct.

3.5 Receptors

Potential receptors of environmental impact present within the site which will require to be addressed include:

- Future site users who may potentially be exposed to COPC through direct contact with impacted soils and/or inhalation of vapours associated with impacted soils; and/or
- Excavation/construction/maintenance workers conducting activities at or in the vicinity of the site, who may potentially be exposed to COPC through direct contact with impacted soils/groundwater present within excavations and/or inhalation fibres/vapours associated with impacted soils/groundwater; and/or
- Future excavation/construction/maintenance workers who may potentially be exposed to volatile or semi-volatile COPCs through the inhalation of vapours via migration; and/or
- Current and/or future flora at the site who may be exposed to contaminants via direct uptake into root systems.

3.6 Preferential Pathways

For the purpose of this assessment, preferential pathways have been identified as natural and/or man-made pathways that result in the preferential migration of COPC as either liquids or gases.

Natural preferential pathways are likely limited to natural lithological borders, such as between porous soils and bedrock, where infiltrating groundwater is vertically confined and begins to migrate laterally.

Man-made preferential pathways are present throughout the site, generally associated with sub-surface service easements and areas of previously disturbed fill material.

The sewerage and stormwater infrastructure abutting the western boundary of the former dry cleaner has been identified as a preferential pathway, and is considered likely to have potentially facilitated transport of CEs from the dry cleaner. Preferential pathways can be created by the generally higher permeability fill materials used as backfill to re-instate sub-surface service easements.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4. Data Gaps

Potential data gaps as identified within the RAP (JBS&G 2019a) within the subject site include:

- **AEC 1** – Greater detail on the vertical and lateral distribution of TCE and PCE source material in soils underlying 134-138 and 140 Henry Street as inferred to be causing elevated levels of soil-vapour impact in shallow soils and at depth on the site.

  Where basements are proposed within 30 m of identified impacts, additional assessment of soil-vapour impacts is required to determine whether potential deep vapour impacts represent a risk to future building developments within PCPV. It is noted that no buildings are proposed within the subject site (apart from the amenities building), however potential basements and buildings will be constructed in the property to the east. On this basis, the risk posed by vapours to adjoining properties requires consideration within this assessment in the context of informing required remedial extents on-site to be protective of future off-site receptors within adjoining basements/buildings.

  As further noted in **Section 1.3,** the site is to be redeveloped for public open space that will result in the removal of all hardstand currently present on-site. This will result in infiltration of water and subsequent migration through the soil profile which may cause on-going impacts to site groundwater in the source area of AEC1.

  On this basis, the pre-remediation investigation within AEC1 is primarily required to inform the remedial extent within soils underlying 134-138 and 140 Henry Street to be protective of future off-site receptors in basements/buildings to the east (within the PCPV development) and removal of on-going source material to groundwater impacts.

- **AEC 3** – Potential occurrence of hydrocarbon impacts within shallow soils underlying transformers within the Allen Place Car Park. It is noted that a single transformer is located within the south-eastern portion of the subject site – in which it is not proposed to complete any assessments until the structure is decommissioned and demolished. On this basis, assessment and validation of this AEC is not the focus of this investigation and will be required to be completed during validation activities for the site; and

- **AEC 4 –** Potential occurrence of localised areas of asbestos impact and/or dissimilar fill characteristics material underlying current hardstand pavements and building footprints. Assessment of this AEC will be completed upon completion of the demolition works and removal of hardstand surfaces. To this extent, assessment of this AEC is not the focus of this investigation and will be required to be completed during validation activities for the site.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5. Sampling and Analysis Plan

5.1 Data Quality Objectives

Data Quality Objectives (DQOs) established for the pre-remediation investigation are discussed in the following sections.

5.1.1 State the Problem

Remedial works are required for principally chlorinated ethene impact at the site. A refined estimate is required of the extent of soil remediation works to facilitate works planning. Additional data is further required to assess the data gaps identified in **Section 4** with respect to AEC1 such that the RWP can be prepared for the development area.

5.1.2 Identify the Decision

The decisions required to be made for the investigation are:

- Have the identified site-related contaminants (chlorinated ethenes) acting as potential source material been appropriately and sufficiently delineated?
- Can a preliminary waste classification be provided for materials that may require off-site disposal during remediation activities?
- Are there any impacts of chemical mixtures?
- Is further assessment required (i.e. is there enough information to prepare a detailed RWP for the development area)?

5.1.3 Identify Inputs to the Decision

The following inputs are required in order to make the stated decisions:

- Previous environmental data available for the site;
- Installation, sampling and analysis of additional sub-slab and soil vapour probes within the site;
- Installation of soil bores for the collection of data associated with waste classification of soils that may require off-site disposal during remediation works as well as the leachability (and corresponding risk to groundwater) of chlorinated ethenes in source material;
- Laboratory analysis data for COPCs;
- Site assessment criteria for potentially impacted media for COPCs; and
- Confirmation that data generated by sampling and analysis are of an acceptable quality to allow reliable comparison to assessment criteria.

5.1.4 Define the Study Boundary

The lateral extent of the study comprises the site (as shown on **Figure 1**) and occupies an area of approximately 0.53 ha and is shown on **Figure 1**.

A soil and soil vapour assessment was conducted within the boundaries of the site (primarily within AEC1) that comprised the installation of sub-slab vapour probes as well as soil vapour probes installed to a depth of 1 m bgs and 4.0 m bgs.

The temporal boundaries of this investigation were limited to the period of assessment works. Seasonal influences are not considered to have a significant impact on the outcomes of the assessment given that the objective of the investigation was to delineate the extent of CE impacted

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

source material within site soils that will require remediation and not assess potential worst case conditions as applicable to vapour intrusion.

5.1.5 Develop a Decision Rule

A summary of the decision rules to be adopted for each of the environmental issues required to be addressed are outlined in **Table 5.1** below.

Table 5.1: Summary of Decision Rules

Decision Required to be Made	Decision Rule
1. Have the identified site-related contaminants (chlorinated ethenes) acting as potential source material been appropriately and sufficiently delineated?	Has data been collected data at the proposed sample locations? Is the additional data collected within AEC1 sufficient to inform the remedial extent within soils underlying 134-138 and 140 Henry Street to be protective of future off-site receptors in basements/buildings to the east (within the PCPV development) and removal of on-going source material to groundwater impacts? Is the CSM considered to be robust for the purposes of the assessment? That is, has the data provided information on a scale that refines the required remediation extent? If Yes to all, the decision is Yes. Otherwise the decision is No.
2. Can a preliminary waste classification be provided for materials that may require off-site disposal during remediation activities?	Representative fill/soil analytical data will be compared against EPA (2014) criteria. Statistical analysis of the data in accordance with relevant guidance documents will be undertaken, where appropriate, to facilitate the provision of a preliminary waste classification of the materials.
3. Are there any impacts of chemical mixtures?	Are there more than one group of contaminants present which increase the risk of harm? If there is, the decision is Yes. Otherwise, the decision is No.
4. Is further assessment required (i.e. is there enough information to prepare a detailed RWP for the development area)?	Assessed by guidance to other decisions.

5.1.6 Specify the Limits on Decision Error

This step is to establish the decision maker's tolerable limits on decision errors, which are used to establish performance goals for limiting uncertainty in the data. Data generated during this assessment must be appropriate to allow decisions to be made with confidence.

There are two types of decision error identified in Australia Standards (AS) 4482.1-2005 'Guide to the investigation and sampling of sites with potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds.' This includes:

a) Deciding that the site is acceptable when it actually is not; and

b) Deciding that the site unacceptable when it is.

Limits are required to be set on each type of error presented here. AS4482.1-2005 nominates that a 5% probability of (a) and 20% probability of (b). It is noted that the application of this relationship assumes a uniform distribution of impact over the site area.

This is not the case for this site, as the site contamination is inferred to be heterogeneously distributed across the site area. This prevents the ready application of this method. The potential for decision errors are therefore required to be qualitatively estimated. Sampling plans and works have been designed to attempt to minimise potential decision errors relating to these decisions.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Recommendations for management and/or future works are cognisant of the potential errors in the interpretation of site data.

To assess the usability of the data prior to making decisions, the data will be assessed against pre-determined Data Quality Indicators (DQIs) established for the project as discussed below in relation to precision, accuracy, representativeness, comparability and completeness (PARCCS parameters).

The DQIs and data assessment criteria are summarised following and presented in **Table 5.2**:

- **Precision** - measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples.
- **Accuracy** - measures the bias in a measurement system. The accuracy of the laboratory data that are generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- **Representativeness** – expresses the degree which sample data accurately and precisely represent a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
- **Comparability** - expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; ensuring analysing laboratories use consistent analysis techniques and reporting methods.
- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.
- **Sensitivity** - expresses the appropriateness of the chosen laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted site assessment criteria.

Table 5.2: Summary of DQIs

Data Quality Objectives	Frequency	Data Quality Indicator
Precision		
Blind duplicates (intra laboratory)	1 / 20 samples	<50% RPD
Blind duplicates (inter laboratory)	1 / 20 samples	<50% RPD
Accuracy		
Surrogate spikes	All organic samples	70-130%
Laboratory control samples	1 per lab batch	70-130%
Matrix spikes	1 per lab batch	70-130%
Representativeness		
Sampling appropriate for media and analytes		-
Samples extracted and analysed within holding times.	-	Soil Organics (7-14 days), inorganics (6 months) Vapour (carbon sorbent tubes) Organics (14 days)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Data Quality Objectives	Frequency	Data Quality Indicator
Trip spike (BTEX only)	1 per sampling event	70-130% recovery
Rinsate blank	1 per sampling event	<LOR
Method blank	1 per lab batch	<LOR
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All samples
Standard analytical methods used for all analyses	All Samples	All samples
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples
Limits of reporting appropriate and consistent	All Samples	All samples
Completeness		
Sample description and COCs completed and appropriate	All Samples	All samples
Appropriate documentation	All Samples	All samples
Satisfactory frequency and result for QC samples	All QA/QC samples	-
Data from critical samples is considered valid	-	Critical samples valid
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted Site assessment criteria	All samples	LOR<= Site assessment criteria

Note: Laboratory QA/QC procedures may differ for carbon sorbent tube analysis

5.1.7 Optimise the Design for Obtaining the Data

The purpose of this step is to identify a resource-effective field investigation sampling design that generates data that are expected to satisfy the criteria specified in the preceding steps of the DQO process. This step provides a general description of the activities necessary to generate and select data collection designs that satisfy decision performance criteria.

Delineation of the extent of chlorinated hydrocarbon contamination in soil and soil vapour is required to inform decisions with respect to remediation at the site. This broadly comprised:

- A sub-slab vapour and soil vapour assessment program; and
- A soil assessment program to inform potential waste classification of soils that may require off-site disposal during remediation works as well as the leachability (and corresponding risk to groundwater) of chlorinated ethenes in source material. The locations of the soil assessment were consistent with the deep soil vapour probes within accessible areas in the north-eastern portion of the site.

The following sections detail the investigation approach for the assessment of each media and constituent.

5.2 Sub-slab / Soil Vapour Assessment

Grid-based soil vapour sampling within the source area of AEC1 was completed. The sampling was completed within accessible areas – noting that most of the commercial spaces within AEC1 are currently still tenanted, which precluded access to certain areas for the investigation. The completed sample locations are shown on **Figure 5**.

To inform the likely vertical remedial extent, soil vapour probes were installed to a depth of 1 and 4 m as consistent with the methodology outlined in **Section 5.2.2**. Noting that the sample locations

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

were required to inform the depth of excavation required to be protective of future off-site receptors in potential basements/buildings to the east (within the PCPV development), the probes were installed in accessible areas that contained elevated CE impact (in sub-slab vapour) and towards the eastern boundary of the subject site.

5.2.1 Sub-Slab Vapour Probe Installation

The following methodology was adopted for the installation of sub-slab vapour probes installed across the extent of the source area:

- Record location of probe using GPS;
- Drill a 16 mm diameter hole through the concrete slab which is anticipated to be approximately 150 mm thick;
- Installation of a Vapor Pin metallic probe following the manufacturer's instructions, which briefly comprises hammering the probe with silicone sleeve into the drilled hole to a depth of the encountered slab thickness; and
- Undertake a leak test via the method detailed in **Section 5.2.3**.

5.2.2 Soil Vapour Probe Installation

The following methodology was adopted for the installation of soil vapour probes:

- Record location of borehole using GPS;
- Placement of a 1 m and 4 m deep borehole at each sample location;
- Assessment of drill cuttings using a PID at a frequency of one head space analysis per 0.5 m;
- Discrete soil samples were collected at approximate 1.0 m intervals as per the methods detailed in **Section 5.3;** and
- Installation of soil vapour probe by use of Teflon tubing, consisting of placement of 2mm graded sand adjoining the base of the sample tube, placement of a nominal thickness of bentonite chips overlying the graded sand, completion of borehole by filling with grout / bentonite chips to the site surface.

5.2.3 Soil Vapour Probe / Sub-slab Sampling and Analysis

The following methodology was adopted to sample the sub-slab and soil vapour probes:

- The soil vapour probes were left to equilibrate for a period of at least 24 h before sampling;
- An GFM500 gas detector was then used to purge each probe for a period of approximately 30 seconds. Gas readings were monitored until oxygen and photo-ionisation detector (PID) readings stabilised;
- Following this a leak detection evaluation was completed via placement of an isopropyl alcohol soaked rag within an air tight box containing the sample train over the top of the backfilled borehole, to assess the potential occurrence of leaks whilst the gas detector was used to purge the sample point. Elevated PID readings on the gas detector were assumed to indicate a leaking probe. Any leaking probes were required to be re-installed and re-checked prior to sampling using the same method;
- Following preliminary confirmation of the absence of any significant leaks, the sub-slab vapour samples were collected onto SKC-Anasorb carbon tubes. An isopropyl alcohol saturated rag was maintained in an airtight box (sealed container containing sample train) throughout purging and sampling for laboratory confirmation of potential leaks. A shroud was used in the chamber to maintain an isopropyl alcohol rich atmosphere over the

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

sampling location. At all sample locations, a 6.3L volume was collected using a calibrated pump at a flow rate of 210 mL/min (30 min sample time) onto a carbon tube;

- Following sample collection, the carbon tubes were removed and capped and stored in a cool dry and dark container that excludes light, prior to analysis in accordance with the laboratory schedule in **Table 5.3**.
- Blind and split duplicate samples were collected by splitting the primary sample tubing into two ports to allow for the collection of the primary and duplicate samples at the same time. Blind and split duplicate samples were collected at a rate of 1/20 primary samples.

5.3 Soil Assessment

Soil samples were collected via push tube using a Geoprobe track mounted drilling rig at the nominated borehole locations for the installation of deep soil vapour probes. Soil samples were collected directly underneath the hardstand (concrete) then generally at 0.5-1.0 m intervals to a maximum depth of 4 m. During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indicators of contamination were noted.

Soil samples will be screened on site during works using a PID to assess the potential presence of VOCs including TCE and PCE. Collected samples were immediately transferred to laboratory supplied sample jars (additional 500 mL plastic bags will be used where asbestos analysis is required). The sample jars/bags were then transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form will be completed and forwarded with the samples to the testing laboratory.

Duplicate soil samples were collected at a rate of one per 20 primary samples. Duplicate samples were collected for QA/QC purposes from the push tube by taking discrete soil samples and placing directly into the sample jars. Samples were not mixed prior to placement into the jars to minimise the potential for loss of volatiles. Similarly, where 500 mL samples were required for duplicate asbestos analysis - no mixing of material was undertaken prior to placement into plastic bags to prevent the loss of free fibres. It is noted that this methodology may result in the calculation of poor RPDs but this is considered acceptable given that the loss of volatiles/fibres may result in the reporting of lower contaminant concentrations than actually present. A trip spike (BTEX only) was collected with each batch of samples.

Not all soil samples collected were analysed. Soil samples were analysed in accordance with the sampling and analytical program (**Table 5.3**).

5.4 Analytical Schedule

JBS&G will contract Eurofins/mgt (Eurofins) as the primary laboratory, with Envirolab Services (Envirolab) as the secondary laboratory. Both laboratories are NATA registered for the required analyses. In addition, the laboratories will be required to meet JBS&G's internal QA/QC requirements.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 5.3: Analytical Schedule

Sample Type	No. of Sampling Locations	Analyses (exc. QA/QC)
Sub-slab/soil vapour	20 soil vapour (16 sub-slab + 4 deep soil vapour probes).	VOC-8260 – 20 samples Isopropanol – 20 samples
Soil	2 locations (at the locations of the deep soil vapour probes)	Contaminant Total concentrations Heavy metals – 2 samples TRH/BTEX – 9 samples VOCs – 9 samples PAHs – 2 samples PCBs – 2 samples OCPs – 2 samples Asbestos – 2 samples Leachability ASLP VOCs – 8 samples ASLP BTEX – 8 samples TCLP heavy metals – 1 sample TCLP PAHs – 1 sample

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6. Assessment Criteria

6.1.1 Vapour Assessment Criteria

In order to assess the human health risks associated with chlorinated ethenes within the source area, concentrations in sub-slab and soil vapour were screened against published levels as sourced from Table 1A(2) in NEPC (2013) and applicable to recreational land-use.

6.1.2 Leachability Assessment

The guidelines considered relevant to the assessment of source material retention on site and the corresponding risk to groundwater are the values provided to ANZG (August 2018[14]) for freshwater ecosystems protective of 95% of species. Modification of the generic screening values to incorporate attenuation and dilution of contaminant levels due to groundwater flow and mixing processes that occur in the discharge zone may be appropriate, subject to further review and justification if required.

6.1.3 Waste Classification Assessment

To address the assessment objective for the provision of a preliminary waste classification of fill/soil materials at the site, laboratory analysis data were compared to threshold concentrations (total and leachable concentrations) published in NSW EPA guidance documentation presented in *NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste* (EPA 2014a[15]).

[14] Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG, August 2018)

[15] *Waste Classification Guidelines, Part 1: Classifying Waste,* NSW Environment Protection Authority, November 2014 (EPA 2014a)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7. Quality Assurance / Quality Control

Given the limited sampling completed to date, a detailed review of the DQIs in accordance with **Section 5.1.6** has not been completed. However, a high-level review indicates that the field sampling and handling procedures produced quality assurance / quality control (QA/QC) results that demonstrate that the soil vapour and soil data are of an acceptable quality and suitable for use in site characterisation.

The NATA certified laboratory results indicate that the project laboratory was generally achieving levels of performance within its recommended control limits during the period when the samples from this program were analysed.

On the basis of the results of the field and laboratory QA/QC program, the soil vapour and soil data are considered to be of an acceptable quality in order to achieve the objectives of the assessment.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8. Vapour Assessment

8.1 Field Observations

Sub-slab and soil vapour probes were installed across 18 sample locations at accessible areas within AEC1 at the site. Borelogs are provided for the soil vapour probes in **Appendix B**. No significant odours or indicators of contamination were observed during placement of the boreholes for the sample locations.

Stabilised oxygen, PID, methane, carbon dioxide and hydrogen sulphide readings were obtained at each sample location prior to collection of the vapour sample. The measured levels are summarised in **Table 8.1**.

Table 8.1: Summary of Field Measured Vapours / Gases at Sub-slab and Soil Vapour Probes

Sample ID	O_2 (%)	PID (ppm)	Carbon Dioxide (%)	Methane (%)	Hydrogen Sulphide (ppm)
Sub-Slab Probes					
SS01	12.1	5.0	5.7	0	0
SS02	6.1	2.6	11.5	0	0
SS03	10.3	0.9	8.4	0	0
SS04	6.2	6.7	11.0	0	0
SS05	3.8	11.2	13.1	0	0
SS06	12.9	3.3	0.9	0	0
SS07	11.4	2.5	5.3	0	0
SS08	3.2	8.9	12.0	0	0
SS09	8.5	2.7	0.0	0	0
SV12	20.8	0.6	0.0	0.2	-
SV13	20.8	1.1	0.0	0	-
SV14	20.8	0.4	0.0	0	-
SV15	20.8	1.1	0.0	0	-
SV16	21.0	0.8	0.0	0	-
SV17	21.0	0.9	0.0	0	-
SV18	20.9	0.8	0.1	0	-
Soil Vapour Probes					
SV10-B (1m probe at SS01)	16.5	11.8	0.0	0.0	-
SV10-A (4m probe at SS01)	10.5	1.5	4.7	0.0	-
SV11-B (1m probe at SS05)	3.0	3.7	0.2	0.0	-
SV11-A (4m probe at SS05)	5.5	0.4	4.5	0.0	-

8.2 Summary of Results

Soil vapour analysis results are summarised in **Appendix A**. Sample locations as undertaken during this assessment are shown on **Figure 5**.

8.2.1 Sub-slab Vapour

Consistent with previous investigations, constituents as measured in soil vapour have been generally restricted to chlorinated hydrocarbons with some minor detections of BTEX compounds. As established in the RAP (2019a), the most significant of the detected constituents with respect to the health risk and proposed future remediation and validation of the site is TCE and PCE.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Elevated levels of TCE and PCE were reported in sub-slab vapour at all locations underlying Shop 3 Gaymark Lane (as represented by SS01 to SS09). In addition, elevated levels of TCE and PCE were reported at historical sub-slab vapour sample locations SV10 and SV14 as collected by JBS&G in previous sampling events. Conversely, the levels of TCE and PCE within samples at SV12 to SV18 were below laboratory detection limits, providing evidence that CE impacts have not migrated to this lateral extent.

8.2.2 Soil Vapour

To inform the likely required remedial excavation depth, JBS&G installed soil vapour probes at depths of 1 m and 4 m at locations SV10 and SV11. At both locations, elevated levels of TCE and PCE were detected in the shallow probe (1 m) but below detection limits in the deeper probes (4 m). This data provides evidence that the low permeability clay soils at the site have retarded the vertical migration of these impacts at the site. This is concordant with the visually observed depth of more permeable fill material overlying residual clays.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

9. Soil Assessment

The lithology encountered at the site during the field works is summarised below. Borehole logs are included in **Appendix B**.

9.1 Field Observations

The soil investigation works comprised a total of two boreholes advanced via push tube within the locations of the two soil vapour probes installed as part of the assessment. Fill material was encountered beneath the existing pavements at both locations to depths of 0.4-0.5 m bgs.

The fill material comprised of brown silty clay of moderate plasticity with inclusions of ash. The fill was underlain by natural grey and brown silty clay of high plasticity to the maximum depth of the investigation (4.2 m bgs). There was no significant evidence of odours/staining observed within the soil/fill profile during the field works. In addition, the PID readings ranged from 1.3-3.1 ppm throughout the soil profile from which the primary source of CE impacts within the fill profile could not be inferred based on the measurements. No visible asbestos containing material was identified during the soil assessment activities.

9.2 Analytical Results

Laboratory analysis results for soil samples completed for the investigation have been summarised in tables presented in **Appendix A**, with comments discussed in the sections below.

9.2.1 Total VOCs

The total concentration of all VOCs in each sample selected for analysis were below the laboratory limit of reporting (LOR) with the exception of PCE within SV11 0.2-0.3 (2.2 mg/kg). Consistent with the soil vapour data discussed in **Section 8**, the CE impacts at AEC1 appear to be confined to shallow soils and fill based materials.

9.2.2 Leachability of VOCs

The leachable concentration (via ASLP) of all VOCs in each sample selected for analysis (including SV11 0.2-0.3) were below the laboratory LOR, indicating the CE impacts at AEC1 appear to be largely non-leachable at the locations assessed.

9.2.3 Preliminary Waste Classification

Comparison of the total contaminant concentrations with the NSW EPA (2014) assessment criteria is presented in **Table A**. In summary, the results were all below the CT1 and/or SCC1 thresholds presented in NSW EPA (2014) for waste classification without toxicity characteristic leaching procedure (TCLP) analysis for all compounds with the exception of benzo(a)pyrene (B(a)P) that within SV10 0.1-0.2 (2.5 mg/kg).

SV10 0.1-0.2 was subsequently scheduled for TCLP B(a)P analysis to inform a preliminary waste classification of materials on-site. The results are presented in **Table B2,** in which the leachable concentration of B(a)P was below the TCLP1 values presented in EPA (2014).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

10. Site Characterisation

Based on the decision-making process for assessing urban redevelopment sites detailed in in EPA (2017)[16] and discussed in **Section 5.1.5**, the decisions required to be made in order to satisfy the objectives of the assessment are discussed below.

10.1 Have the identified site-related contaminants (chlorinated ethenes) acting as potential source material been appropriately and sufficiently delineated?

JBS&G (2020) presented a detailed sampling plan to refine the required remedial extent within AEC1, however due to tenants currently occupying commercial spaces within the area access has been restricted to the locations shown on **Figure 5**.

Elevated levels of PCE and TCE were reported in sub-slab vapour at all locations underlying Shop 3 Gaymark Lane (as represented by SS01 to SS09). In addition, elevated levels of TCE and PCE were reported at historical sub-slab vapour sample locations SV10 and SV14 as collected by JBS&G in previous sampling events. Conversely, the levels of TCE and PCE within samples at SV12 to SV18 were below laboratory detection limits, providing evidence that soil vapour has not migrated to this lateral extent. On this basis, the inferred lateral extent of CE impacted soils acting as potential source material (to soil vapour) is shown on **Figure 5** – equating to an area of approximately 650 m^2. It is noted that the lateral source material extent has been conservatively included to comprise of the area around SV18 and extending west towards SV12-SV17 and east towards Gaymark Lane, where limited data has been collected.

To inform the likely depth of CE source material, JBS&G installed soil vapour probes at depths of 1 m and 4 m at locations SV10 and SV11. At both locations, elevated levels of TCE and PCE were detected in the shallow probe (1 m) but below detection limits in the deeper probes (4 m). This data provides evidence that the low permeability clay soils at the site have retarded the vertical migration of these impacts at the site. This is concordant with the visually observed depth of more permeable fill material overlying residual clays and the detection of PCE within the shallow soil sample SV11 0.2-0.3 (2.2 mg/kg) that was in turn, reported at below detection limits in all underlying soil samples.

Noting the limitations in the way of access, additional assessment is proposed prior to completing the remediation works to further delineate the lateral and vertical extent of source material within AEC1. It is noted too that the location where CE impacts have historically migrated from the shallow soils to underlying groundwater (that is approximately 7 m bgs) has not been determined. Based on the potential that the former site operator may have disposed of dry-cleaning fluids either down the sewer or stormwater drains, the greatest impacts are expected within the trenches of these underground utilities that extend from the property. On this basis, the additional assessment works will be required to target these potential preferential pathways such that all source material at AEC1 can be identified and the final remedial extent can be defined.

10.2 Can a preliminary waste classification be provided for materials that may require off-site disposal during remediation activities?

Based on the total contaminant concentrations within samples collected from in-situ materials assessed herein and comparison to NSW EPA (2014) assessment criteria identified that the fill based soils at the site are largely consistent with a preliminary waste classification of General Solid Waste (GSW).

It is noted that within SV10 0.1-0.2, the B(a)P concentration exceeded the CT1 and/or SCC1 thresholds presented in NSW EPA (2014) for waste classification without TCLP analysis. Additional TCLP B(a)P analysis of this sample identified that the leachable concentration of B(a)P were below

[16] Contaminated Land Management, Guidelines for the NSW Site Auditor Scheme (3rd edition), NSW EPA, October 2017 (EPA 2017(.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

the TCLP1 values presented in EPA (2014). Consistent with the observation of ash within the fill materials assessed herein, the preliminary TCLP data suggests that the PAHs are largely non-leachable and likely immobilised within the ash matrix in fill. As such, it is anticipated that the General Approvals of the Immobilisation of Contaminants in Waste (EPA 1999/05) will in the future be applied in conjunction with additional laboratory data to confirm an appropriate waste classification for off-site disposal of excess excavated material

10.3 Are there any impacts of chemical mixtures?

There were no potential chemical mixtures identified during the investigation that may pose a management issue at the site.

10.4 Is further assessment required (i.e. is there enough information to prepare a detailed RWP for the development area)?

As noted in **Section 10.1**, further assessment is required to refine the lateral and vertical extent of source material that will require remediation within AEC 1. In addition, further assessment of potential impacts associated with AEC 3 and AEC 4 will be required following demolition of existing structures as detailed in **Section 4**.

Notwithstanding, the preliminary data presented herein has refined the lateral extent of CE impacted soils that will require remediation to an approximate area of 650 m^2. In addition, the depth of CE impacted soils acting as source material appears confined to shallow soils based on the results of the soil vapour analysis (1 and 4 m soil vapour probes) as well as total contaminant concentrations within soil samples analysed. Further, based on the ASLP data from selected soil analysis, the CE impacts within soils appear to be non-leachable (at the locations assessed) and therefore not likely to present an on-going source to groundwater impacts. As such, with the additional data collected herein, there is considered to be sufficient information to prepare a draft RWP with the preferred remedial approach as specific to the proposed development scheme (**Appendix C**).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

11. Conclusions

Based on the data presented herein and subject to the limitations presented in **Section 12**, the following conclusions are made:

- Consistent with historical investigations, elevated levels of tetrachloroethylene (PCE) and trichloroethylene (TCE) were reported in sub-slab vapour at sample locations underlying Shop 3 Gaymark Lane (as represented by SS01 to SS09). Conversely, the levels of TCE and PCE within samples at locations within the western portion of AEC1 (SV12 to SV18) were below laboratory detection limits, providing evidence that soil vapour has not migrated to this lateral extent. On this basis, the inferred lateral extent of CE impacted soils acting as potential source material (to soil vapour) and requiring remediation has been refined to an area of approximately 650 m^2 as shown on **Figure 5**. Additional assessment, as outlined herein will likely further refine this inferred lateral remediation extent.
- To inform the likely depth of CE source material, JBS&G installed soil vapour probes at depths of 1 m and 4 m at locations SV10 and SV11. At both locations, elevated levels of TCE and PCE were detected in the shallow probe (1 m) but below detection limits in the deeper probes (4 m). This data provides evidence that the low permeability clay soils at the site have retarded the vertical migration of these impacts at the site. This is concordant with the visually observed depth of more permeable fill material overlying residual clays and the detection of PCE within the shallow soil sample SV11 0.2-0.3 (2.2 mg/kg) that was in turn, reported at below detection limits in all underlying soil samples. Additional assessment, as outlined herein will likely further refine this inferred vertical remediation extent.
- The leachable concentration (via Australian Standard Leaching Procedure, ASLP) of all VOCs in each soil sample selected for analysis (including SV11 0.2-0.3) were below the laboratory LOR, indicating the CE impacts at AEC1 appear to be largely non-leachable at the locations assessed and therefore unlikely to present an on-going risk to groundwater.
- Based on the total contaminant concentrations and leachable concentrations (via toxicity characteristic leaching procedure, TCLP) within samples collected from in-situ materials assessed herein and comparison to NSW EPA (2014) assessment criteria identified that the fill based soils at the site are largely consistent with a preliminary waste classification of General Solid Waste (GSW).
- Additional assessment is required to further refine the lateral and vertical extent of source materials within AEC1 that will require remediation. In addition, the additional investigations will require to assess the extent of CE impacts within underground service trenches within AEC1, where the former site operator potentially disposed of dry-cleaning fluids that historically caused environmental impacts (potentially to depth). The additional investigations are proposed to be completed when the commercial tenants (within the area of AEC1) vacate the properties prior to remediation works.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

12. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquiries.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

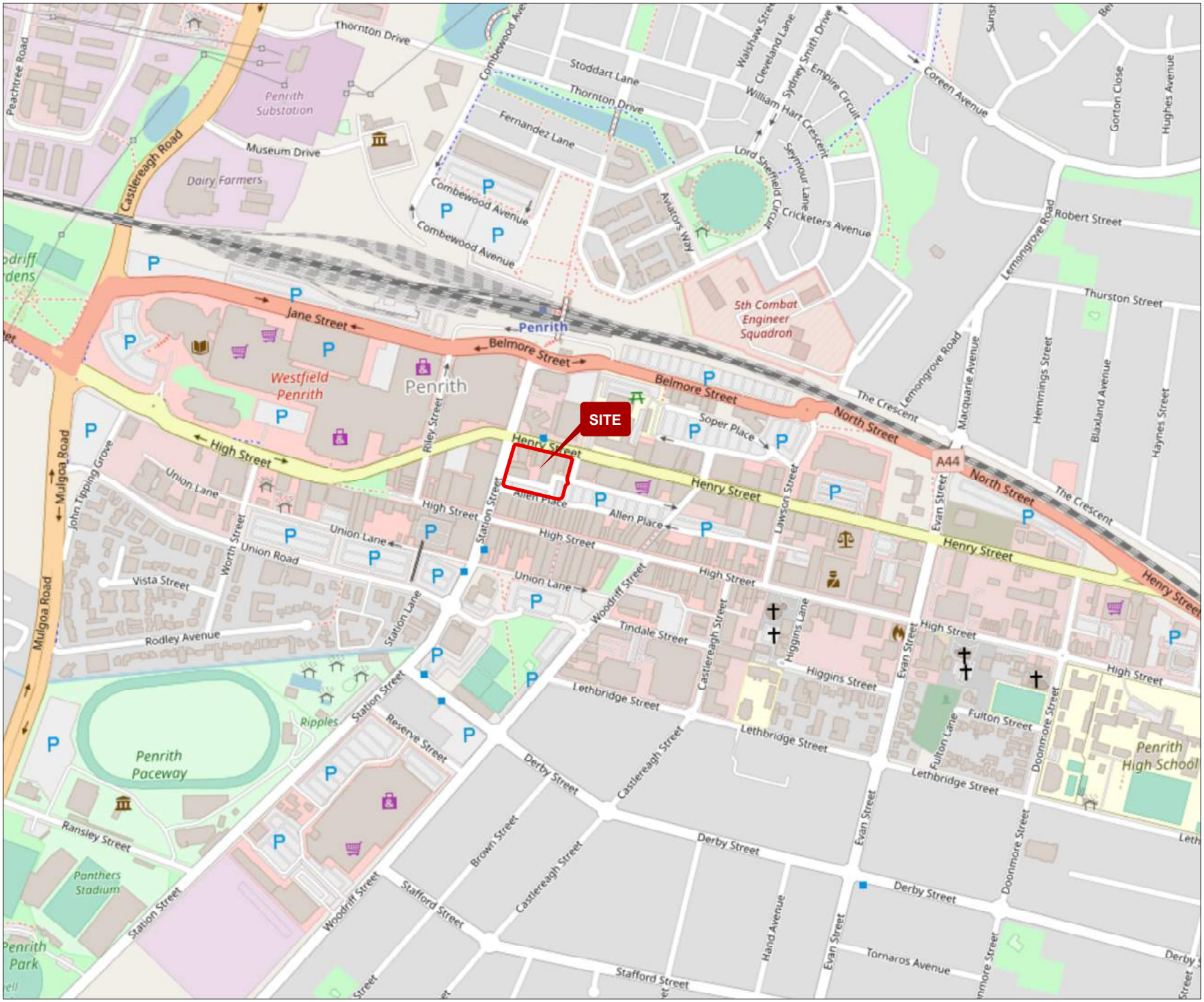
Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figures

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



Legend:

Approximate Site Boundary

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R04 Rev A	Date: 03-Dec-2020
Drawn By: RF/RH	Checked By: CB

Scale 1:8,500

0 100 200

metres

Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SITE LOCATION

FIGURE 1

Reference: © OpenStreetMap (and) contributors, CC-BY-SA

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Project Boundary of Previous Investigations
- Approximate Site Boundary
- Cadastre (NSW LPI, 2019)
- Site Features Polygon
- Sewerage Infrastructure / Preferential Pathway

Areas of Environmental Concern

- AEC 1- Dry Cleaners Location
- AEC 2 - Former Service Station Location
- AEC 4 - Transformer

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R04 Rev 0	Date: 03-Dec-2020
Drawn By: JA/RH	Checked By: CB

Scale 1:600

0 7.5 15

metres

Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SITE LAYOUT

FIGURE 2

J:\Projects\58140 Penrith City Council\58140 Penrith City Park Pre-remediation Works\GIS\Maps\R04 Rev A\58140_02_SiteLayout.mxd
Reference: Near Map www.nearmap.com, imagery date 20-01-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Project Boundary of Previous Investigations
- Approximate Site Boundary
- Approximate Lot Boundary
- Site Features Polygon
- Sewerage Infrastructure / Preferential Pathway

Areas of Environmental Concern

- AEC 1- Dry Cleaners Location
- AEC 2- Former Service Station Location
- AEC 4 - Transformer

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R04 Rev A	Date: 03-Dec-2020
Drawn By: RF	Checked By: CB

Scale 1:1,400

0 10 20
metres

Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SITE LAYOUT AND AREAS OF ENVIRONMENTAL CONCERN

FIGURE 3

J:\Projects\58140 Penrith City Council\58140 Penrith City Park Pre-remediation Works\GIS\Maps\R04 Rev A\58140_03_AreasEnvConcern.mxd
Reference: Near Map www.nearmap.com, imagery date 20-01-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Project Boundary of Previous Investigations
- Approximate Site Boundary
- Approximate Lot Boundary
- Site Features Polygon
- Sewerage Infrastructure / Preferential Pathway

Areas of Environmental Concern

- AEC 1- Dry Cleaners Location
- AEC 2- Former Service Station Location
- AEC 4 - Transformer

Sample Location

- PSM Groundwater Monitoring Well
- JBS&G Groundwater Monitoring Well
- JBS&G Borehole
- JBS&G Hand Auger

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R04 Rev A	Date: 03-Dec-2020
Drawn By: RF	Checked By: CB

Scale 1:1,400

0 20 40

metres

Coor. Sys. GDA 1994 MGA Zone 56

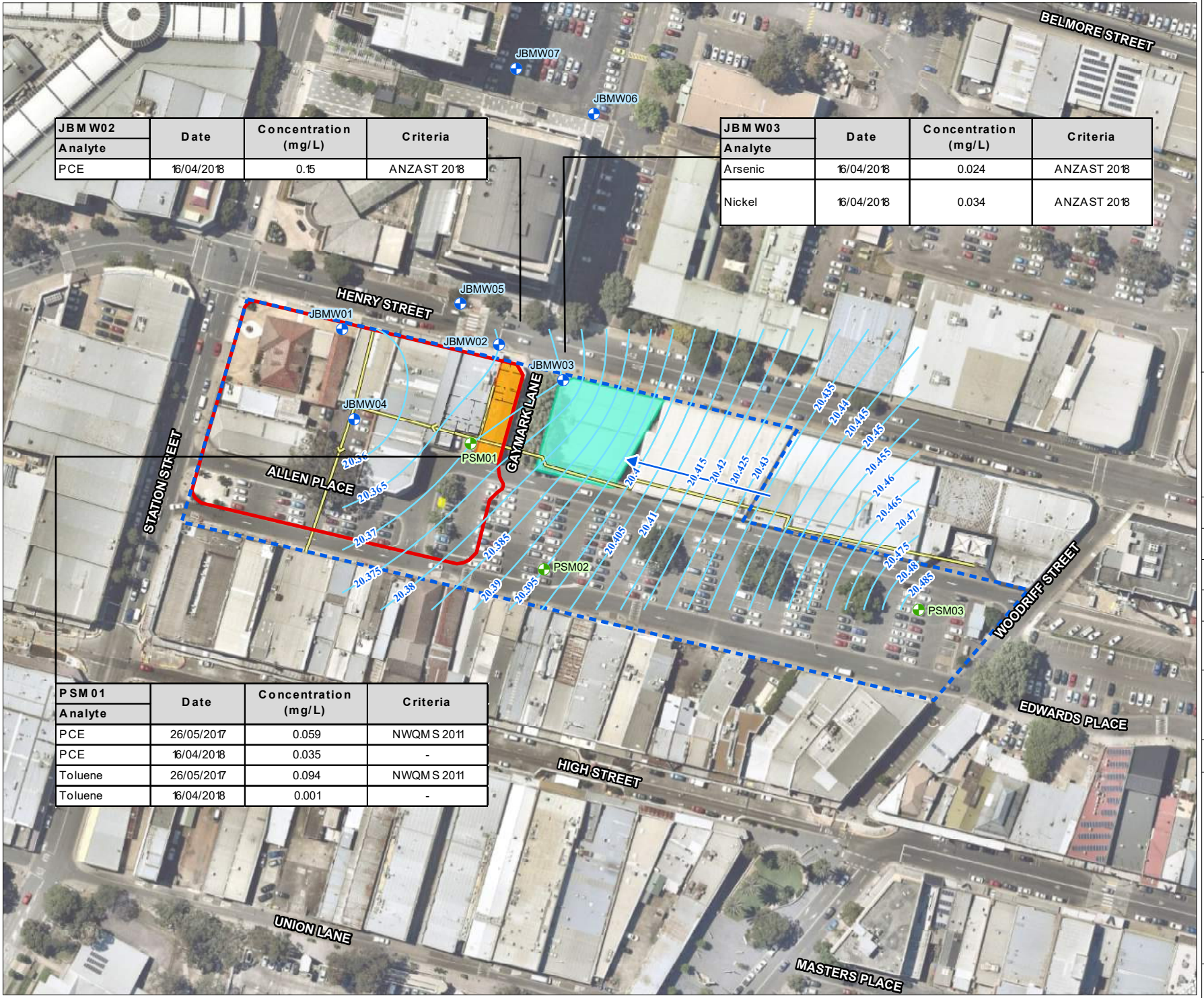
42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

HISTORICAL SOIL SAMPLE LOCATIONS AND TIER 1 EXCEEDANCES

FIGURE 4A

Reference: Near Map www.nearmap.com, imagery date 30-10-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



JBMW02 / Analyte	Date	Concentration (mg/L)	Criteria
PCE	16/04/2018	0.15	ANZAST 2018

JBMW03 / Analyte	Date	Concentration (mg/L)	Criteria
Arsenic	16/04/2018	0.024	ANZAST 2018
Nickel	16/04/2018	0.034	ANZAST 2018

PSM01 / Analyte	Date	Concentration (mg/L)	Criteria
PCE	26/05/2017	0.059	NWQMS 2011
PCE	16/04/2018	0.035	-
Toluene	26/05/2017	0.094	NWQMS 2011
Toluene	16/04/2018	0.001	-

Legend:

- Project Boundary of Previous Investigations
- Approximate Site Boundary
- Site Features Polygon
- Sewerage Infrastructure / Preferential Pathway

Areas of Environmental Concern

- AEC 1- Dry Cleaners Location
- AEC 2- Former Service Station Location
- AEC 4 - Transformer

Sample Location

- PSM Well
- JBS&G Groundwater Monitoring Well
- Groundwater Contours (m AHD)
- Inferred Groundwater Flow Direction

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R04 Rev A | Date: 03-Dec-2020

Drawn By: RF | Checked By: CB

Scale 1:1,750

0 20 40
metres

Coor. Sys. GDA 1994 MGA Zone 56

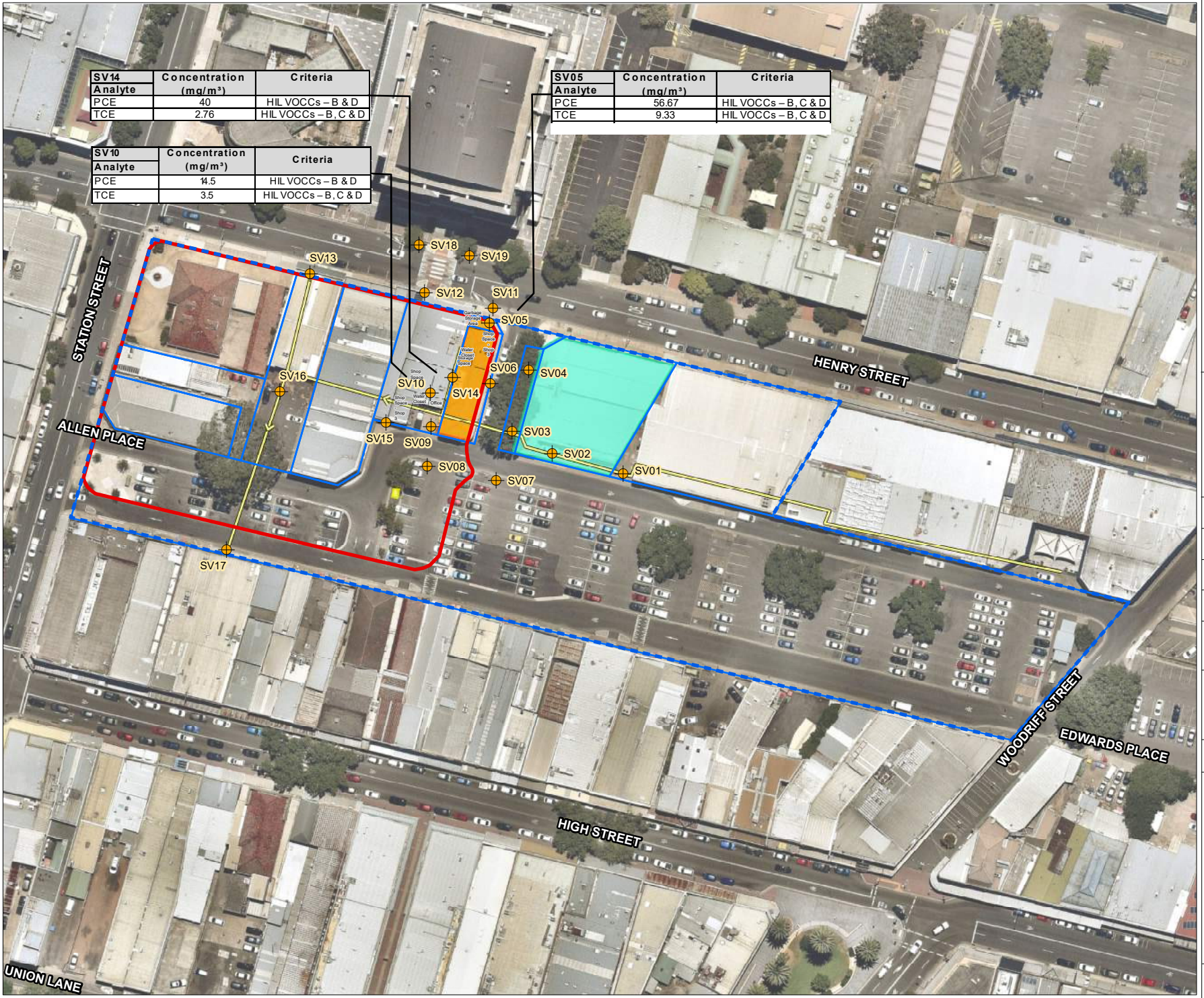
42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

GROUNDWATER WELL LOCATIONS, TIER 1 EXCEEDANCES & INFERRED GROUNDWATER FLOW DIRECTION

FIGURE 4B

Path: J:\Projects\58140 Penrith City Park Pre-remediation Works\GIS\Maps\R04 Rev A\58140_04B_GWLoc.mxd
Reference: Near Map www.nearmap.com, imagery date 30-10-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



Legend:

- Project Boundary of Previous Investigations
- Approximate Site Boundary
- Approximate Lot Boundary
- Site Features Polygon
- Sewerage Infrastructure / Preferential Pathway

Areas of Environmental Concern

- AEC 1- Dry Cleaners Location
- AEC 2- Former Service Station Location
- AEC 4 - Transformer

Sample Location

- JBS&G Soil Vapour

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R04 Rev A	Date: 03-Dec-2020
Drawn By: RF	Checked By: CB

Scale 1:1,400

0 10 20
metres

Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SOIL VAPOUR SAMPLE LOCATIONS & TIER 1 EXCEEDANCES

FIGURE 4C

Path: J:\Projects\58140 Penrith City Park Pre-remediation Works\GIS\Maps\R04 Rev A\58140_04C_SoilVapour.mxd
Reference: Near Map www.nearmap.com, imagery date 20-01-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Project Boundary of Previous Investigations
- Approximate Site Boundary
- Approximate Lot Boundary
- Site Features Polygon
- Sewerage Infrastructure / Preferential Pathway
- Former Dry Cleaner
- 1/134-138 Henry Street
- Shop 3 - 140 Henry Street
- External Alleyway

Areas of Environmental Concern

- AEC 1- Dry Cleaners Location
- AEC 2- Former Service Station Location
- AEC 4 - Transformer

Investigation Locations

- JBS&G Ambient Air Sample
- JBS&G Soil Vapour

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R04 Rev A	Date: 03-Dec-2020
Drawn By: RF	Checked By: CB

Scale 1:400

0 5 10
metres

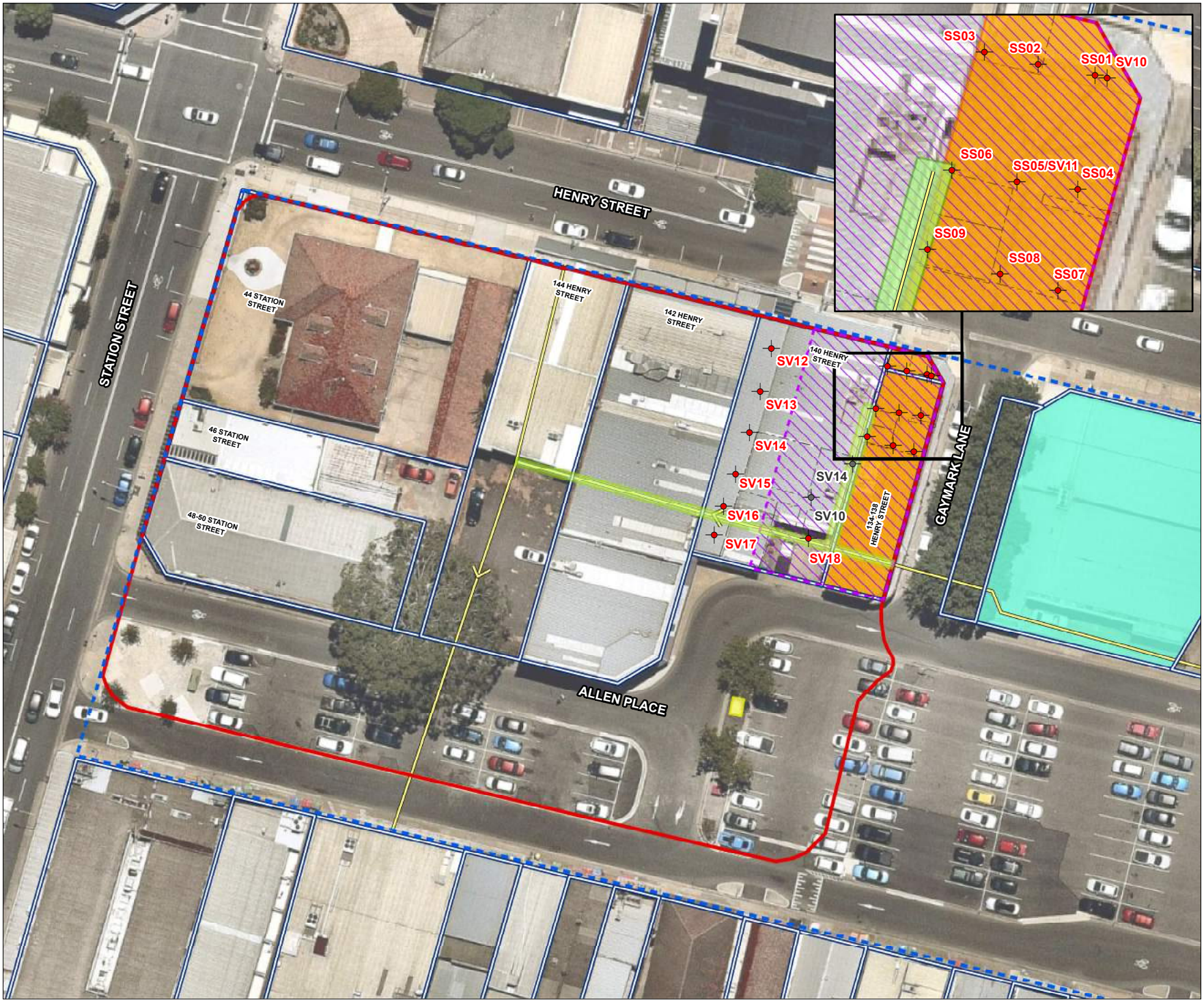
Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

134-138 & 140 HENRY STREET
FLOOR PLAN & VAPOUR
SAMPLE LOCATIONS

FIGURE 4D

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



Legend:

- Approximate Site Boundary
- Cadastre (NSW LPI, 2019)

Type

- Inferred Remedial Extent
- Sewer Trench Remediation
- Project Boundary of Previous Investigations
- Sewerage Infrastructure / Preferential Pathway
- Site Features

Areas of Environmental Concern

- AEC 1- Dry Cleaners Location
- AEC 2- Former Service Station Location
- AEC 4 - Transformer
- Sample Location (JBS&G 2019)
- Sample Location (JBS&G 2020)

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R04 Rev 0	Date: 04-Dec-2020
Drawn By: JA/RH	Checked By: CB

Scale 1:700

0 9 18

metres

Coor. Sys. GDA 1994 MGA Zone 56

48-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SAMPLE LOCATIONS AND REMEDIAL EXTENT

FIGURE 5

G:\Projects\58140 Penrith City Council\58140 Penrith City Park Pre-remediation Works\GIS\Maps\R04 Rev A\58140_05_SampleLocationsRemedialExtent.mxd
Reference: Near Map www.nearmap.com, imagery date 20-01-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix A Summary Analytical Tables

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table A: Soil Total Contaminant COncentrations
Project Number: 58140
Project Name: Penrith Pre-Remediation Investigation

			Metals & Metalloids								TPHs (NEPC 1999)					TRHs (NEPC 2013)							BTEXN							Polycyclic Aromatic Hydrocarbons																	
			Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Total)	>C10-C16 Fraction	>C16-C34 Fraction	>C34-C40 Fraction	>C10-C40 Fraction (Total)	>C10-C16 less Naphthalene (F2)	C6-C10 Fraction	C6-C10 less BTEX (F1)	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)	Naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(a)pyrene TEQ (medium bound)*	Benzo(b,j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	PAHs (Total)	Pyrene
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			2	0.4	5	5	5	0.1	5	5	20	20	50	50	50	50	100	100	100	50	20	20	0.1	0.1	0.1	0.1	0.2	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
NSW 2014 General Solid Waste CT1 (No Leaching)			100	20	100		100	4	40		650				10000								10	600	288			1000						0.8												
Field_ID	**LocCode**	**Sampled_Date-Time**																																													
SV10 0.1-0.2	SV10 0.1-0.2	29/05/2020	11	<0.4	17	37	87	0.2	18	110	<20	<20	64	<50	64	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	1.8	2.5	3.5	1.8	1.3	2	1.9	<0.5	6.2	<0.5	1.3	3.1	28	6.1
SV10 1.3-1.4	SV10 1.3-1.4	29/05/2020	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SV10 2.3-2.4	SV10 2.3-2.4	29/05/2020	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SV10 4.0-4.1	SV10 4.0-4.1	29/05/2020	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SV11 0.2-0.3	SV11 0.2-0.3	29/05/2020	4.8	<0.4	26	13	19	<0.1	9.8	45	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
SV11 1.0-1.1	SV11 1.0-1.1	29/05/2020	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SV11 2.0-2.1	SV11 2.0-2.1	29/05/2020	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SV11 3.0-3.1	SV11 3.0-3.1	29/05/2020	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SV11 4.0-4.1	SV11 4.0-4.1	29/05/2020	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<50	<100	<100	<100	<50	<20	<20	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table A: Soil Total Contaminant COncentrations
Project Number: 58140
Project Name: Penrith Pre-Remediation Investigation

| | | | | Organochlorine Pesticides | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Chlorinated Alkanes | | | | | | | | | | | | | | | | | | | | | | | | Chlorinated Alkenes | | | | | | | | | | Solvents | Polychlorinated Biphenyls | | | | | | | | |
|---|---|---

Table A: Soil Total Contaminant COncentrations
Project Number: 58140
Project Name: Penrith Pre-Remediation Investigation

			Monocyclic Aromatic Hydrocarbons					Miscellaneous Hydrocarbons						Chlorinated Benzenes						Trihalomethanes				Asbestos										Organic Sulfur Compounds	Other	EPA VIC - IWRG621			
			1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	Bromobenzene	Isopropylbenzene	Styrene	1,2-dibromoethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromomethane	Dibromomethane	Iodomethane	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Hexachlorobenzene	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	Approx. Sample Mass	Asbestos from ACM in Soil	Asbestos from FA & AF in Soil	Mass ACM	Mass Asbestos in ACM	Mass FA	Mass Asbestos in FA	Mass AF	Mass Asbestos in AF	Mass Asbestos in FA & AF	Carbon disulfide	% Moisture 103oC	Chlorinated Hydrocarbons EPAVic	Other Chlorinated Hydrocarbons EPAVic	Organochlorine Pesticides EPAVic	Other Organochlorine Pesticides EPAVic
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	g	%w/w	%w/w	g	g	g	g	g	g	mg/kg	%	mg/kg	mg/kg	mg/kg	mg/kg
EQL			0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.05	0.5	0.5	0.5	0.5										0.5	1	0.5	0.5	0.1	0.1
NSW 2014 General Solid Waste CT1 (No Leaching)							60		4000					86		150	2000			120																		
Field_ID	**LocCode**	**Sampled_Date-Time**																																				
SV10 0.1-0.2	SV10 0.1-0.2	29/05/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	469	0	0	0	0	0	0	0	0	0	<0.5	19	<0.5	<0.5	<0.2	<0.2
SV10 1.3-1.4	SV10 1.3-1.4	29/05/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	<0.5	22	<0.5	<0.5	-	-
SV10 2.3-2.4	SV10 2.3-2.4	29/05/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	<0.5	21	<0.5	<0.5	-	-
SV10 4.0-4.1	SV10 4.0-4.1	29/05/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	<0.5	11	<0.5	<0.5	-	-
SV11 0.2-0.3	SV11 0.2-0.3	29/05/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.05	<0.5	<0.5	<0.5	<0.5	510	0	0	0	0	0	0	0	0	0	<0.5	6.6	2.2	2.2	<0.2	<0.2
SV11 1.0-1.1	SV11 1.0-1.1	29/05/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	<0.5	22	<0.5	<0.5	-	-
SV11 2.0-2.1	SV11 2.0-2.1	29/05/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	<0.5	23	<0.5	<0.5	-	-
SV11 3.0-3.1	SV11 3.0-3.1	29/05/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	<0.5	22	<0.5	<0.5	-	-
SV11 4.0-4.1	SV11 4.0-4.1	29/05/2020	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	<0.5	15	0.9	0.9	-	-

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table B1: ASLP Results
Project Number: 58140
Project Name: Penrith Pre-Remediation Investigation

	BTEXN						Chlorinated Alkanes																			Chlorinated Alkenes											Solvents	Monocyclic Aromatic Hydrocarbo					Miscellaneous Hydrocarbons						Chlorinated Benzenes				Trihalomethanes				Organic Sulfur Compounds	Ionic Balance	VIC - IWRG	
	Benzene	Ethylbenzene	Toluene	Xylene (o)	Xylene (m & p)	Xylene (Total)	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	Bromochloromethane	Carbon tetrachloride	Chloroethane	Chloromethane	Dichlorodifluoromethane	Dichloromethane	Trichlorofluoromethane	1,1-dichloroethene	3-chloropropene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride	2-Propanone (Acetone)	1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	Bromobenzene	Isopropylbenzene	Styrene	1,2-dibromoethane	2-Butanone (MEK)	4-Methyl-2-pentanone (MIBK)	Bromomethane	Dibromomethane	Iodomethane	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	Carbon disulfide	pH (Leachate fluid)	Chlorinated Hydrocarbons EPAVic	Other Chlorinated Hydrocarbons EPAVic
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ph Units	µg/L	µg/L
EQL	0.02	0.02	0.02	0.02	0.04	0.06	0.02	0.02	0.005	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.005	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	20	0.02	0.02	0.02	0.02	0.02	0.02	0.005	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.1	20	5
Field_ID	**LocCode**	**Sampled_Date-Time**																																																										
SV10 0.1-0.2	SV10 0.1-0.2	29/05/2020	<0.02	<0.02	<0.02	<0.02	<0.04	<0.06	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	6.4	<100	<100
SV10 1.3-1.4	SV10 1.3-1.4	29/05/2020	<0.02	<0.02	<0.02	<0.02	<0.04	<0.06	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	6.4	<100	<100
SV10 2.3-2.4	SV10 2.3-2.4	29/05/2020	<0.02	<0.02	<0.02	<0.02	<0.04	<0.06	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	6.4	<100	<100
SV10 4.0-4.1	SV10 4.0-4.1	29/05/2020	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.4	<100	<100
SV11 0.2-0.3	SV11 0.2-0.3	29/05/2020	<0.02	<0.02	<0.02	<0.02	<0.04	<0.06	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	6.4	<100	<100
SV11 1.0-1.1	SV11 1.0-1.1	29/05/2020	<0.02	<0.02	<0.02	<0.02	<0.04	<0.06	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	6.4	<100	<100
SV11 2.0-2.1	SV11 2.0-2.1	29/05/2020	<0.02	<0.02	<0.02	<0.02	<0.04	<0.06	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	6.4	<100	<100
SV11 3.0-3.1	SV11 3.0-3.1	29/05/2020	<0.02	<0.02	<0.02	<0.02	<0.04	<0.06	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	6.4	<100	<100
SV11 4.0-4.1	SV11 4.0-4.1	29/05/2020	<0.02	<0.02	<0.02	<0.02	<0.04	<0.06	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<20	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.01	<0.02	<0.02	<0.01	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05	<0.02	<0.02	<0.02	6.4	<100	<100

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table B2: TCLP Analytical Results
Project Number: 58140
Project Name: Penrith Pre-Remediation Investigation

			Metals & Metalloids								BTEXN	Polycyclic Aromatic Hydrocarbons																
			Arsenic (Total)	Cadmium	Chromium (Total)	Copper	Lead	Mercury (Inorganic)	Nickel	Zinc	Naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a)pyrene	Benzo(b,j)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	PAHs (Total)	Pyrene
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EQL			0.01	0.005	0.05	0.05	0.01	0.001	0.01	0.05	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
NSW EPA (2014) TCLP1			5	1	5		5	0.2	2							0.04											
Field_ID	LocCode	Sampled_Date-Time																									
SV10 0.1-0.2	SV10 0.1-0.2	1/08/2020	<0.01	<0.005	<0.05	<0.05	<0.01	<0.001	0.03	0.12	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table C: Vapour Analytical Results
Project Number: 58140
Project Name: Penrith Pre-Remediation Investigation

				BTEXN					Chlorinated Alkanes														Chlorinated Alkenes									
				Benzene	Ethylbenzene	Toluene	Xylene (Total)	Naphthalene	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,2,3-trichloropropane	1,2-dibromo-3-chloropropane	1,2-dichloroethane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromochloromethane	Carbon tetrachloride	Trichlorofluoromethane	1,1-dichloroethene	1,1-dichloropropene	2-chlorotoluene	4-chlorotoluene	cis-1,2-dichloroethene	cis-1,3-dichloropropene	tetrachloroethene	trans-1,3-dichloropropene	Trichloroethene	Vinyl Chloride
				mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3
EQL				0.08	0.08	0.08	0.250000001	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
NEPM 2013 Table 1A(2) Rec C Soil Vap VOCC HILs										1200																						
NEPM 2013 Table 1A(5) Rec C Soil Vapour HSL for Vapour Intrusion, Clay 0-1m				3000	NL	NL	NL	NL																				2		40		0.4	0.5
Field_ID	**Sampled_Date-Time**	**Lab_Report_Number**	**LocCode**																														
SS01 (FRONT)	18/05/2020	720161	SS01 (FRONT)	<0.08	<0.08	0.1333	0.6	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	0.25	<0.08	20	<0.08	3	<0.08
SV10-B (FRONT)	30/05/2020	722975	1m probe at SS01	<0.08	<0.08	0.1333	<0.25	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	0.2333	<0.08	<0.08	<0.08	0.2	<0.08	5.833	<0.08	1.283	<0.08
SV10-A (FRONT)	30/05/2020	722975	4m probe at SS01	<0.08	<0.08	<0.08	<0.25	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
SS02 (FRONT)	18/05/2020	720161	SS02 (FRONT)	<0.08	0.08333	0.15	0.6833	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	11.17	<0.08	0.9	<0.08
SS03 (FRONT)	18/05/2020	720161	SS03 (FRONT)	<0.08	<0.08	0.1667	0.6333	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	2.833	<0.08	0.2167	<0.08
SS04 (FRONT)	18/05/2020	720161	SS04 (FRONT)	<0.08	0.08333	0.15	0.65	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	0.7667	<0.08	26.67	<0.08	2	<0.08
SS05 (FRONT)	18/05/2020	720161	SS05 (FRONT)	<0.08	<0.08	0.1167	0.4333	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	1.417	<0.08	38.33	<0.08	2	<0.08
SV11-B (FRONT)	30/05/2020	722975	1m probe at SS05	<0.08	<0.08	0.1	<0.25	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	6	<0.08	<0.08	<0.08	5.167	<0.08	65	<0.08	3.667	<0.08
SV11-A (FRONT)	30/05/2020	722975	4m probe at SS05	<0.08	<0.08	<0.08	<0.25	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
SS06 (FRONT)	18/05/2020	720161	SS06 (FRONT)	<0.08	<0.08	0.1167	0.45	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	0.2	<0.08	10.67	<0.08	0.2833	<0.08
SS07 (FRONT)	18/05/2020	720161	SS07 (FRONT)	<0.08	<0.08	0.08333	0.25	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	14.17	<0.08	0.3	<0.08
SS08 (FRONT)	18/05/2020	720161	SS08 (FRONT)	<0.08	0.1167	0.2	0.85	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	1.35	<0.08	35	<0.08	2.5	<0.08
QC01 (FRONT)	18/05/2020	720161	SS08 (FRONT)	<0.08	<0.08	0.1167	0.5833	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	1.4	<0.08	38.33	<0.08	2.667	<0.08
SS09 (FRONT)	18/05/2020	720161	SS09 (FRONT)	<0.08	<0.08	<0.08	<0.25	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	0.5833	<0.08	10.5	<0.08	0.8667	<0.08
QA01	18/05/2020	243115	SS09 (FRONT)	<0.32	<0.79	<0.79	<0.79	<0.79	-	-	-	-	-	-	-	<0.79	-	-	-	-	<0.79	-	-	-	-	-	-	6.83	-	<0.79	-
SV12 (FRONT)	30/05/2020	722975	SV12 (FRONT)	<0.08	<0.08	<0.08	<0.25	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
SV13 (FRONT)	30/05/2020	722975	SV13 (FRONT)	<0.08	<0.08	<0.08	<0.25	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
SV14 (FRONT)	30/05/2020	722975	SV14 (FRONT)	<0.08	<0.08	<0.08	<0.25	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
SV15 (FRONT)	30/05/2020	722975	SV15 (FRONT)	<0.08	<0.08	<0.08	<0.25	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
SV16 (FRONT)	30/05/2020	722975	SV16 (FRONT)	<0.08	<0.08	<0.08	<0.25	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
SV17 (FRONT)	30/05/2020	722975	SV17 (FRONT)	<0.08	<0.08	<0.08	<0.25	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
SV18 (FRONT)	30/05/2020	722975	SV18 (FRONT)	<0.08	<0.08	<0.08	<0.25	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table C: Vapour Analytical Results
Project Number: 58140
Project Name: Penrith Pre-Remediation Investigation

				Monocyclic Aromatic Hydrocarbons									Miscellaneous Hydrocarbons		Chlorinated Benzenes						Trihalomethanes				Miscellaneous Industrial Chemical	Organic Alcohols
				1,2,4-trimethyl benzene	1,3,5-trimethyl benzene	4-isopropyl toluene	Isopropylbenzene	n-butyl benzene	n-propyl benzene	sec-butyl benzene	Styrene	tert-butyl benzene	1,2-dibromoethane	Dibromomethane	1,2,3-trichlorobenzene	1,2,4-trichlorobenzene	1,2-Dichlorobenzene	1,3-dichlorobenzene	1,4-dichlorobenzene	Chlorobenzene	Bromodichloromethane	Chloroform	Dibromochloromethane	Tribromomethane	Hexachlorobutadiene	Isopropyl alcohol
				mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3	mg/m3
EQL				0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.833333335	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	1.6
NEPM 2013 Table 1A(2) Rec C Soil Vap VOCC HILs																										
NEPM 2013 Table 1A(5) Rec C Soil Vapour HSL for Vapour Intrusion, Clay 0-1m																										
Field_ID	**Sampled_Date-Tim**	**Lab_Report_Numbe**	**LocCode**																							
SS01 (FRONT)	18/05/2020	720161	SS01 (FRONT)	0.1667	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SV10-B (FRONT)	30/05/2020	722975	1m probe at SS01	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SV10-A (FRONT)	30/05/2020	722975	4m probe at SS01	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SS02 (FRONT)	18/05/2020	720161	SS02 (FRONT)	0.2	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SS03 (FRONT)	18/05/2020	720161	SS03 (FRONT)	0.15	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SS04 (FRONT)	18/05/2020	720161	SS04 (FRONT)	0.2	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SS05 (FRONT)	18/05/2020	720161	SS05 (FRONT)	0.1167	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SV11-B (FRONT)	30/05/2020	722975	1m probe at SS05	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	0.2	<0.08	<0.08	<0.08	<1.6
SV11-A (FRONT)	30/05/2020	722975	4m probe at SS05	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SS06 (FRONT)	18/05/2020	720161	SS06 (FRONT)	0.1167	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SS07 (FRONT)	18/05/2020	720161	SS07 (FRONT)	0.08333	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SS08 (FRONT)	18/05/2020	720161	SS08 (FRONT)	0.2333	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
QC01 (FRONT)	18/05/2020	720161	SS08 (FRONT)	0.2	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SS09 (FRONT)	18/05/2020	720161	SS09 (FRONT)	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
QA01	18/05/2020	243115	SS09 (FRONT)	-	-	-	-	-	-	-	<0.79	-	-	-	-	-	-	-	-	<0.79	-	-	-	-	-	<0.79
SV12 (FRONT)	30/05/2020	722975	SV12 (FRONT)	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SV13 (FRONT)	30/05/2020	722975	SV13 (FRONT)	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SV14 (FRONT)	30/05/2020	722975	SV14 (FRONT)	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SV15 (FRONT)	30/05/2020	722975	SV15 (FRONT)	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SV16 (FRONT)	30/05/2020	722975	SV16 (FRONT)	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SV17 (FRONT)	30/05/2020	722975	SV17 (FRONT)	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6
SV18 (FRONT)	30/05/2020	722975	SV18 (FRONT)	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.8	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08	<1.6

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix B Borelogs

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

SOIL VAPOUR PROBE SV10

PROJECT NUMBER 58140	**DRILLING COMPANY** Terratest	**EASTING** N/A
PROJECT NAME Penrith City Park Pre-remediatic	**DRILLER**	**NORTHING** N/A
CLIENT Penrith City Council	**DRILL RIG**	**COORD SYS** GDA94_MGA_zone_54
ADDRESS Penrith Central Park Village	**DRILLING METHOD** Push Tube:Push Tube	**COORD SOURCE**
DRILLING DATE 29/05/2020	**DIAMETER** 50 mm	**LOGGED BY** MN
COMPLETION	**CASING**	**SCREEN INTERVAL** 4.2 - 1 m bgl

COMMENTS

Drilling Method	Water (m bgl)	Well Details	Depth (m bgl)	Graphic Log	Lithological Description	Moisture	Samples	PID	Additional Observations
PT					Tiles with concrete slab underneath.	D			No ACM, odours or staining observed.
			0.2		Silty clay, brown, heterogeneous, dry, firm, medium plasticity, with inclusion of ash.	D	SV10 0.1-0.2	1.3	No ACM, odours or staining observed.
			0.4						
			0.6		Silty clay, lighter brown, homogeneous, dry, firm, medium plasticity.	D	SV10 0.5-0.6	2.6	No ACM, odours or staining observed.
			0.8						
			1						
			1.2						
			1.4		Silty clay, grey, homogeneous, dry, hard, high plasticity.	D	SV10 1.3-1.4	2.8	No ACM, odours or staining observed.
			1.6						
			1.8						
			2						
			2.2						
			2.4		Silty clay, darker grey, homogeneous, dry, hard, high plasticity.	D	SV10 2.3-2.4	1.2	No ACM, odours or staining observed.
			2.6						
			2.8						
			3						
			3.2						
			3.4				SV10 3.4-3.5	1.5	
			3.6		Silty clay, brown/grey with light grey mottling, dry, hard, high plasticity.	D			No ACM, odours or staining observed.
			3.8						
			4				SV10 4.0-4.1	1.9	
			4.2		Termination Depth at:4.200 m.				

Disclaimer This log is intended for environmental not geotechnical purposes.

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

SOIL VAPOUR PROBE SV11

PROJECT NUMBER 58140	**DRILLING COMPANY** Terratest	**EASTING** N/A
PROJECT NAME Penrith City Park Pre-remediatic	**DRILLER**	**NORTHING** N/A
CLIENT Penrith City Council	**DRILL RIG**	**COORD SYS** GDA94_MGA_zone_54
ADDRESS Penrith Central Park Village	**DRILLING METHOD** Push Tube:Push Tube	**COORD SOURCE**
DRILLING DATE 29/05/2020	**DIAMETER** 50 mm	**LOGGED BY** MN
COMPLETION	**CASING**	**SCREEN INTERVAL** 4.2 - 1 m bgl

COMMENTS

Drilling Method	Water (m bgl)	Well Details	Depth (m bgl)	Graphic Log	Lithological Description	Moisture	Samples	PID	Additional Observations
PT					Tiles with concrete slab underneath.	D	SV11 0.0-0.1	2.4	No ACM, odours or staining observed.
			0.2		Silty clay, brown, heterogeneous, firm, medium plasticity, with inclusion of ash.	D	SV11 0.2-0.3	1.9	No ACM, odours or staining observed.
			0.4		Silty clay, grey/brown with brown mottling turning orange between 2.0 and 2.2 m bgs, firm, high plasticity.	D	SV11 0.5-0.6	2.9	No ACM, odours or staining observed.
			0.6						
			0.8						
			1				SV11 1.0-1.1	3	
			1.2						
			1.4						
			1.6						
			1.8						
			2				SV11 2.0-2.1	2.8	
			2.2						
			2.4		Silty clay, brown/grey, homogeneous, dry, stiff, high plasticity.	D			No ACM, odours or staining observed.
			2.6				SV11 2.5-2.6	2.8	
			2.8		Silty clay, darker brown/grey with light brown/grey mottling, very hard, high plasticity.	D			No ACM, odours or staining observed.
			3				SV11 3.0-3.1	2.7	
			3.2						
			3.4						
			3.6				SV11 3.5-3.6	2.5	
			3.8						
			4				SV11 4.0-4.1	3.1	
			4.2		Termination Depth at:4.200 m.				

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

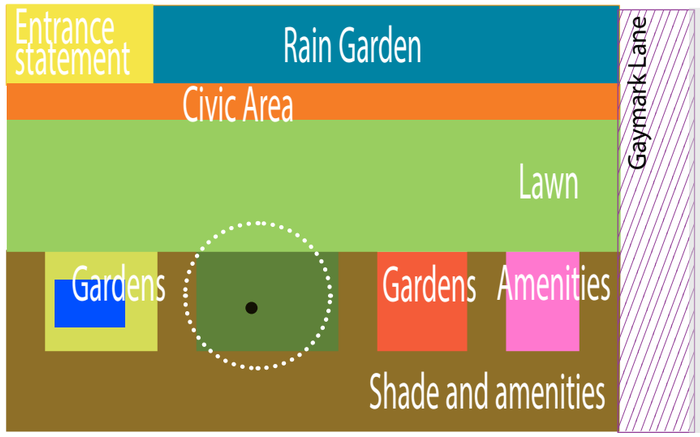
Appendix C Design Plans

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Henry St

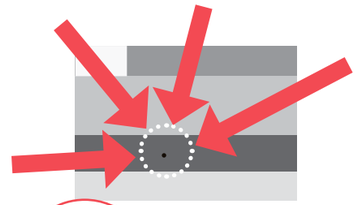
Station St



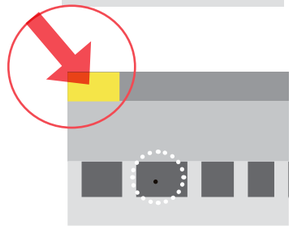
Allen Place

High St

Key principles

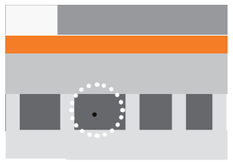


Celebrate the tree



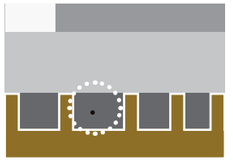
Open the corner to Station Street, allow clear views in and integrate landmark

Use rain garden to define the Northern edge and protect from street



Civic area on the Northern Edge that is protected from Henry Street

Maximise the scale by emphasizing length



Provide shade and amenities screening southern edge

Gardens and trees as a place of respite for more intimate experience include water

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5 Aims - Create a City Park with

- **A strong identity**
  create a vibrant city Centre and celebrate the local landscape

- **A variety of use opportunities**
  flexibility for events and passive activation

- **A variety of spaces**
  respond to the aspirations & needs of a diverse community throughout the seasons

- **Environmental benefits**
  mitigate heat island effect, permeable, incorporate WSUD and native vegetation

- **Social benefits**
  the park as a meeting point, building the community

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

CITY PARK
PENRITH

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Detail Concept Plan

Legend

- EOW - City Park
- EOW - Road Works

- a Entrance statement
- b Raingardens
- c Central Lawn
- d Pergola
- e Amenities Building
- f Informal Stage
- g Market Stalls
- h Gardens - Informal Lawn
- i Gardens - Cumberland Plain Grasses
- j Gardens - Sensory Planting
- k Electrical Substation
- l Threshold/pedestrian crossings

- Feature Seat
- Low Bridge
- Mist
- Hardstand Pavement - Feature pavement
- Hardstand Pavement - Green concrete
- Hardstand Pavement - Recycled brick
- Water Feature

- Existing Feature Tree
- Deciduous Trees
- Evergreen Trees
- Feature Tree

- New Traffic flow

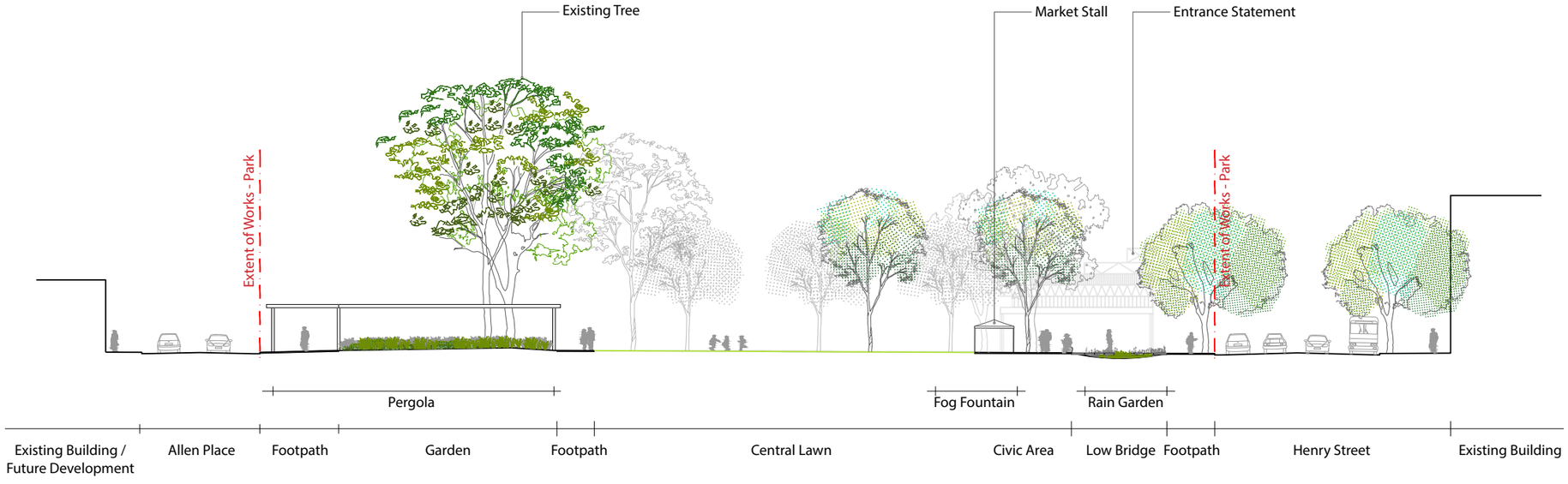
1:500 @ A3

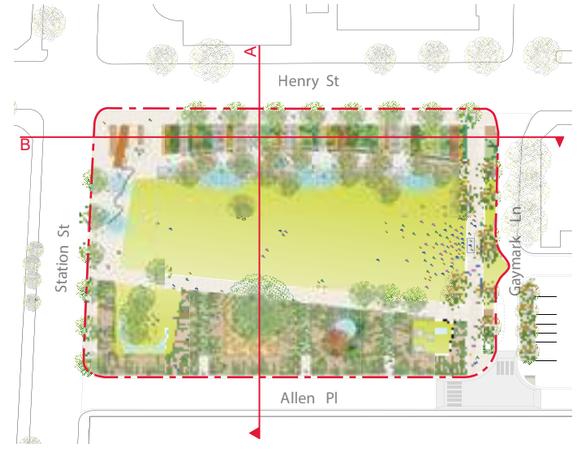
0 5 10 20m

JMD design

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

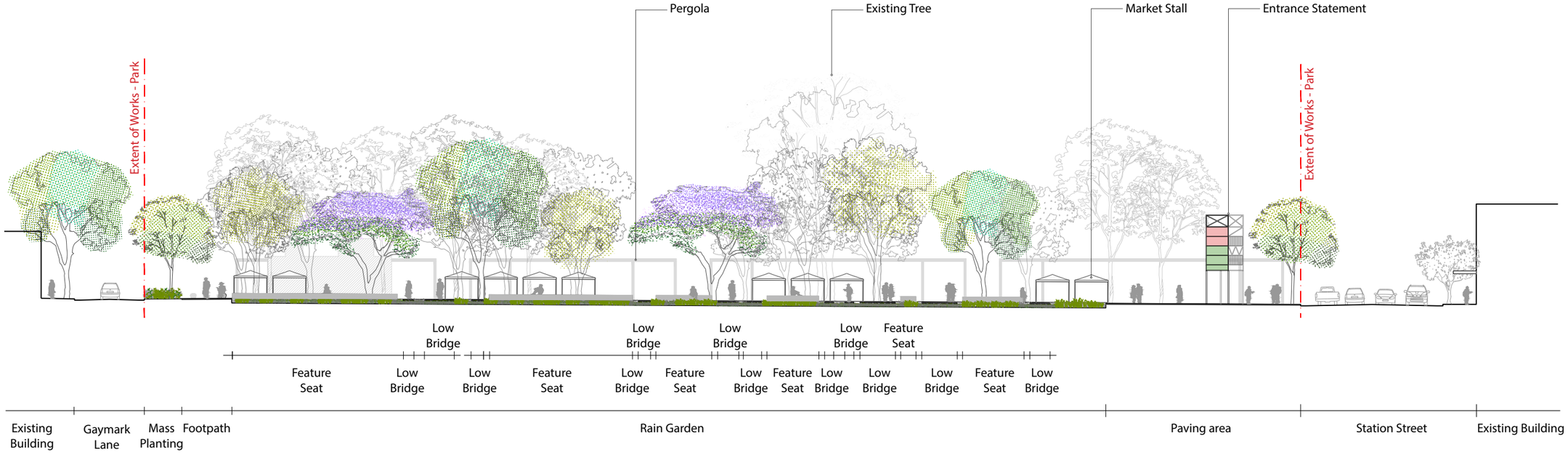
Sections





Section A
1:400 @ A3

0 1 2 4m



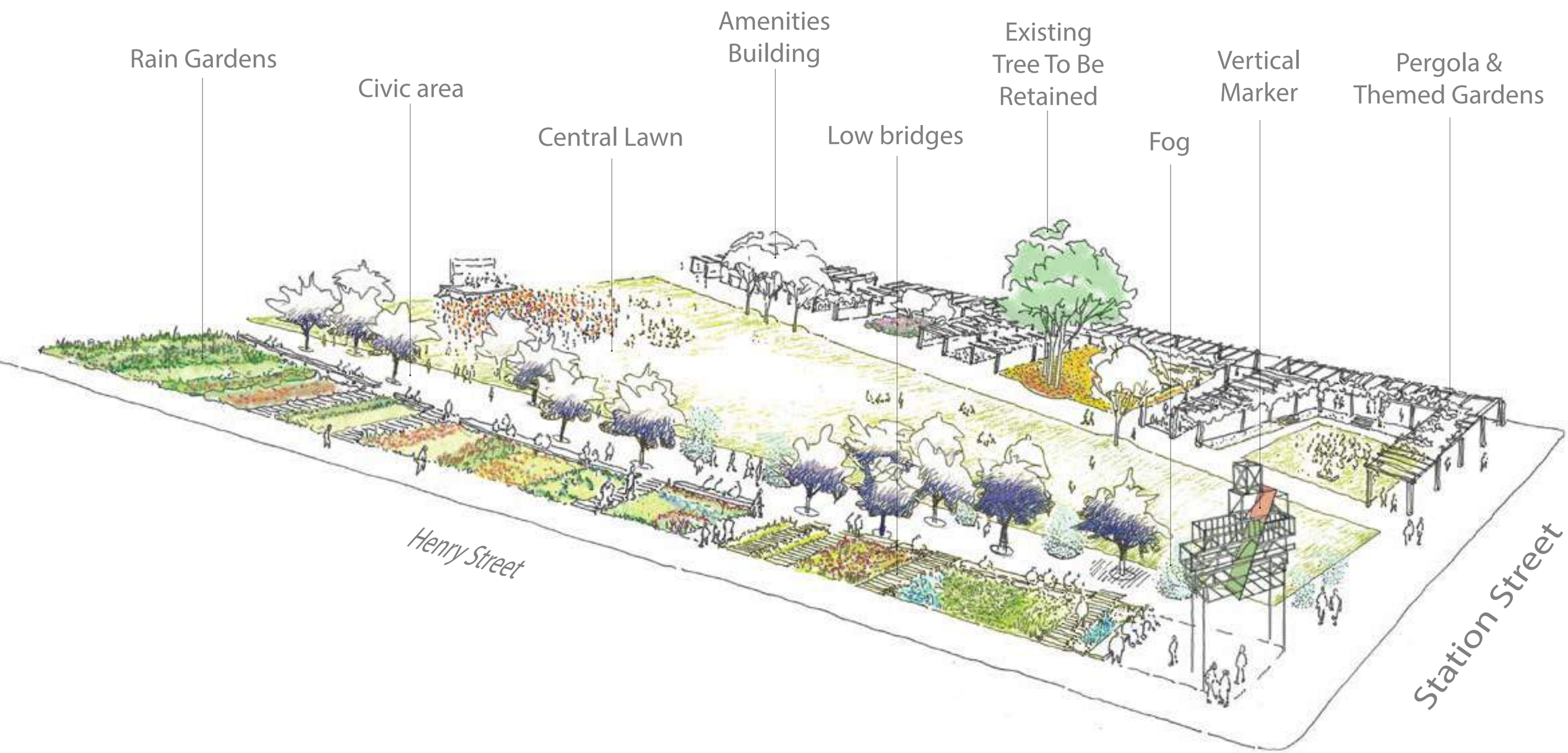
Section B
1:400 @ A3

0 1 2 4m

JMD design

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Aerial View



Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Vertical marker/Entrance statement

JMD design

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Permeability / Connectivity

JMD design

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Civic/ Activation

JMD design

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Roof & Cooling

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Trees

JMD design

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Matron Ruby Grant Park, Green Square

Harold Park storm water channel
& bridges by JMDdesign

Rain Garden

Henry St

Separate the cars from the park

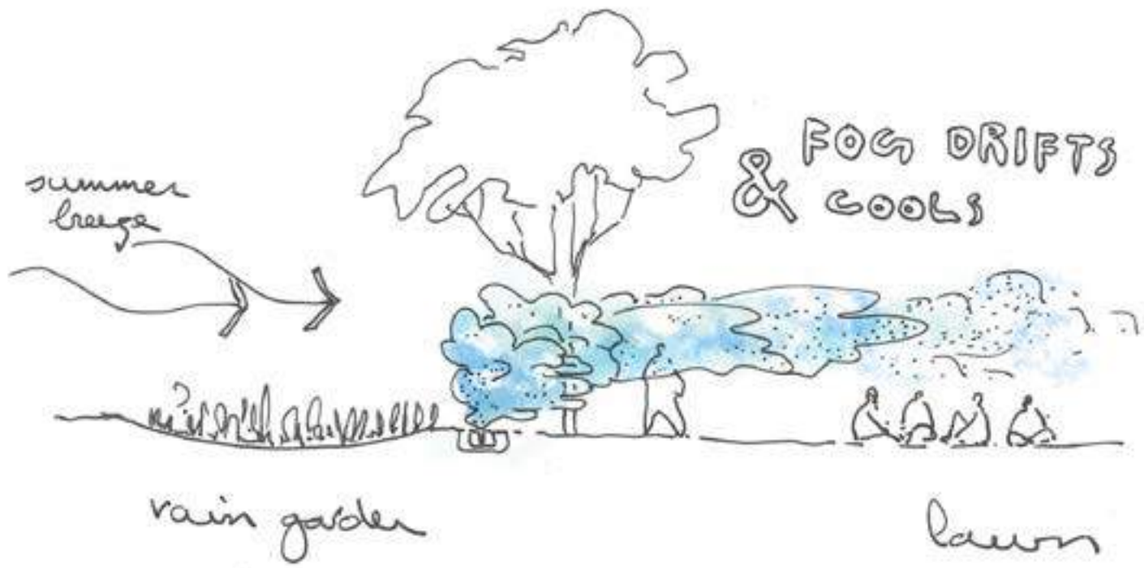
Henry St

Insert a rain garden as a buffer

City Park

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Fog noozles on groundfloor



Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Pergola

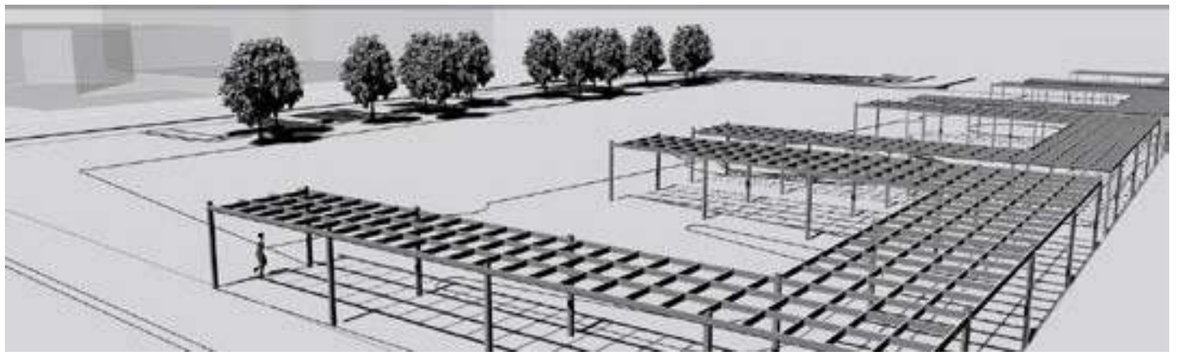
1

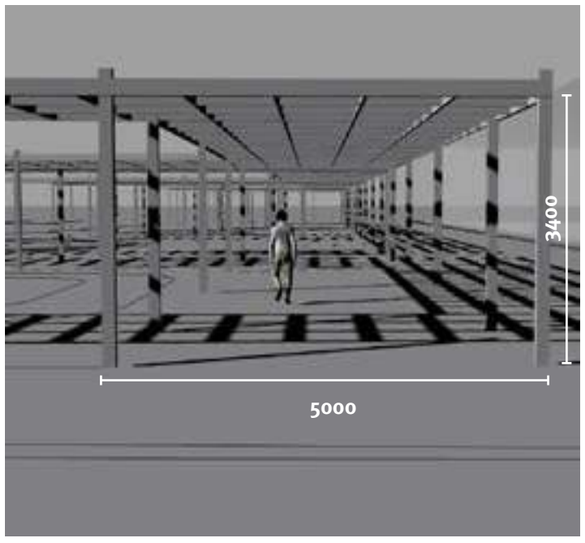
2

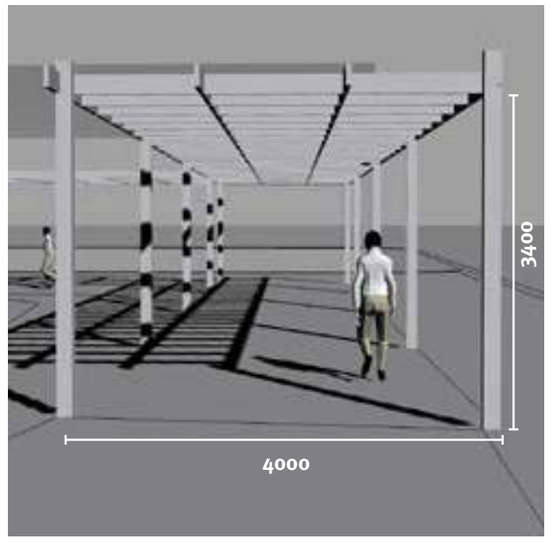
3

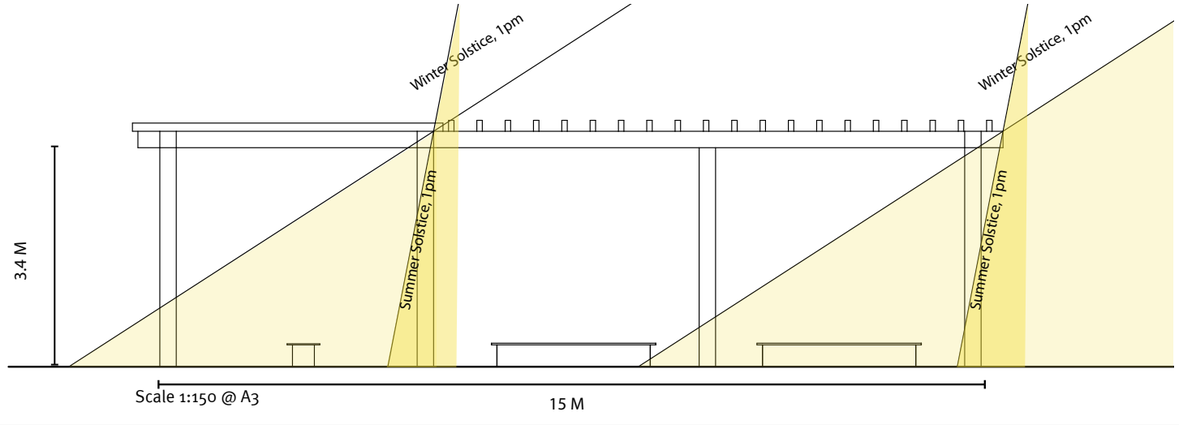
4

1 - Noble Hughes House, Sydney by David Boyle Architect;
2 - Sitio Roberto Burle Marx, Brasil;
3 - Sandringham gardens Hyde Park, Sydney;
4 - Waterfront of thessaloniki, Greece by Nikifordis-Cuomo architects.









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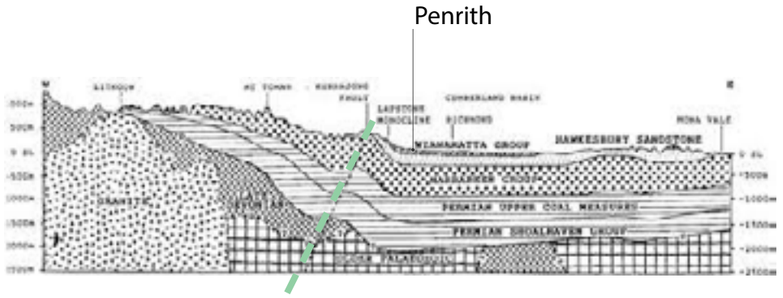
Version: 1, Version Date: 14/04/2021

Explore the trusses patterns of Penrith's most iconic bridges

Victoria bridge

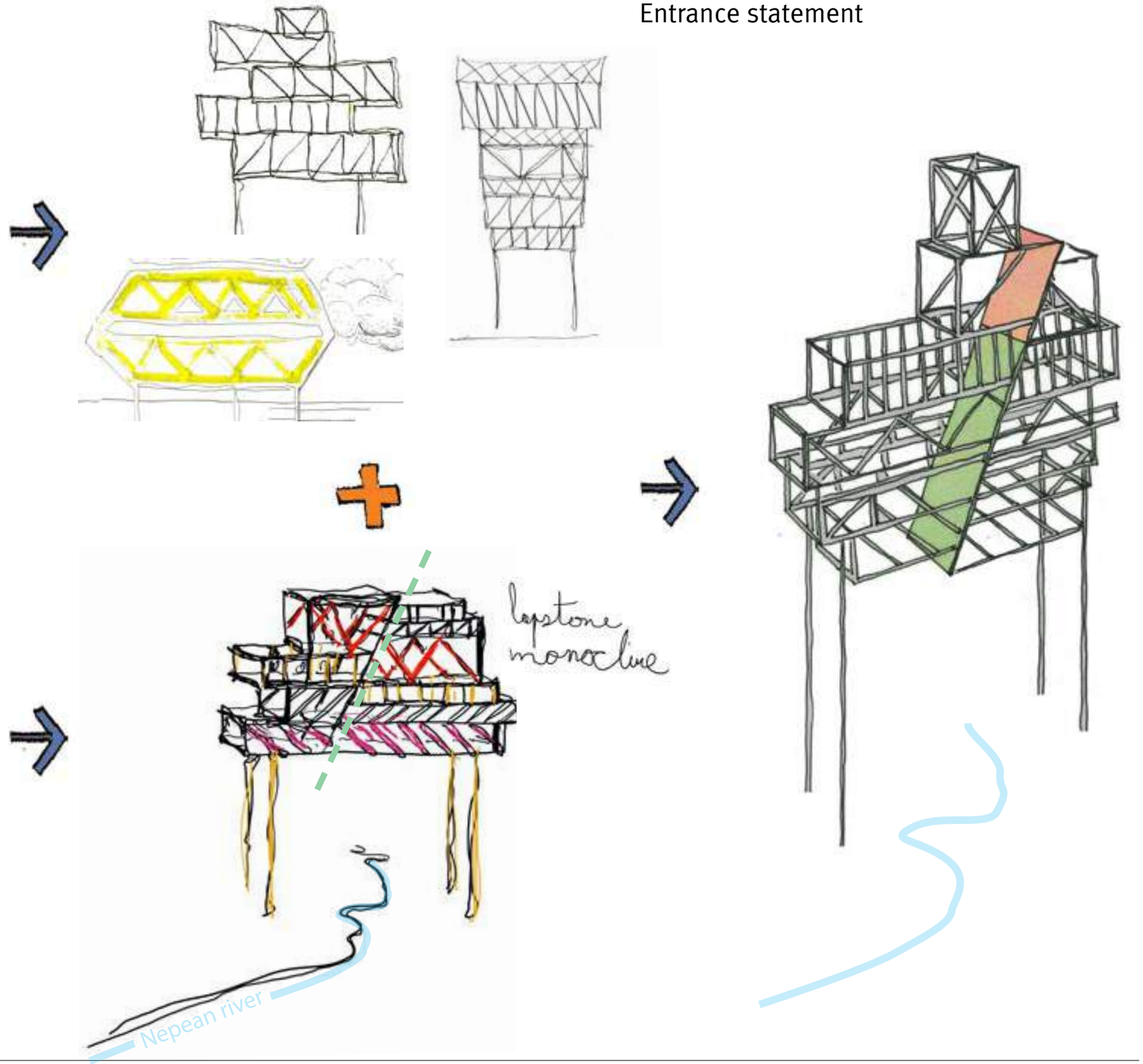
Nepean river green bridge

Interprete the Sydney basin geology in relation to the Penrith region



Sydney Basin west to east geological cross section
Australian Plants Society, North Shore Group (2011)

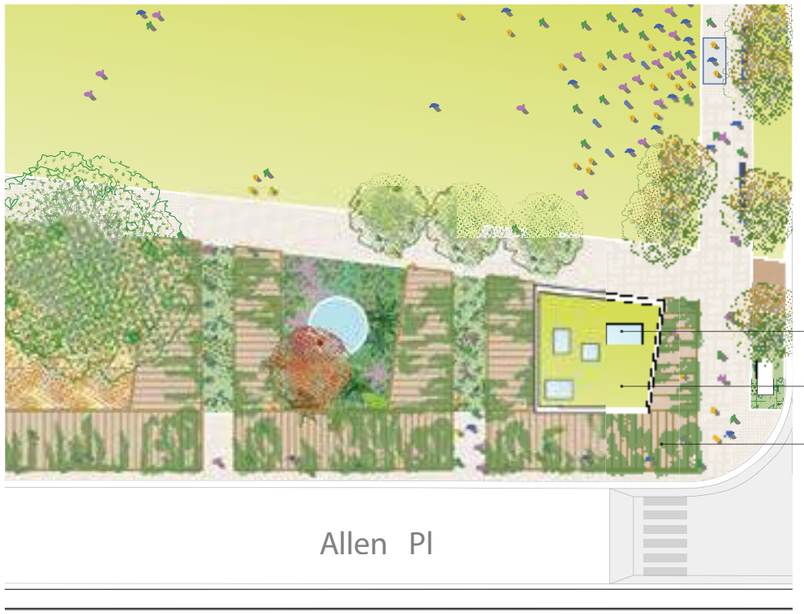
Entrance statement



JMD design

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Amenities

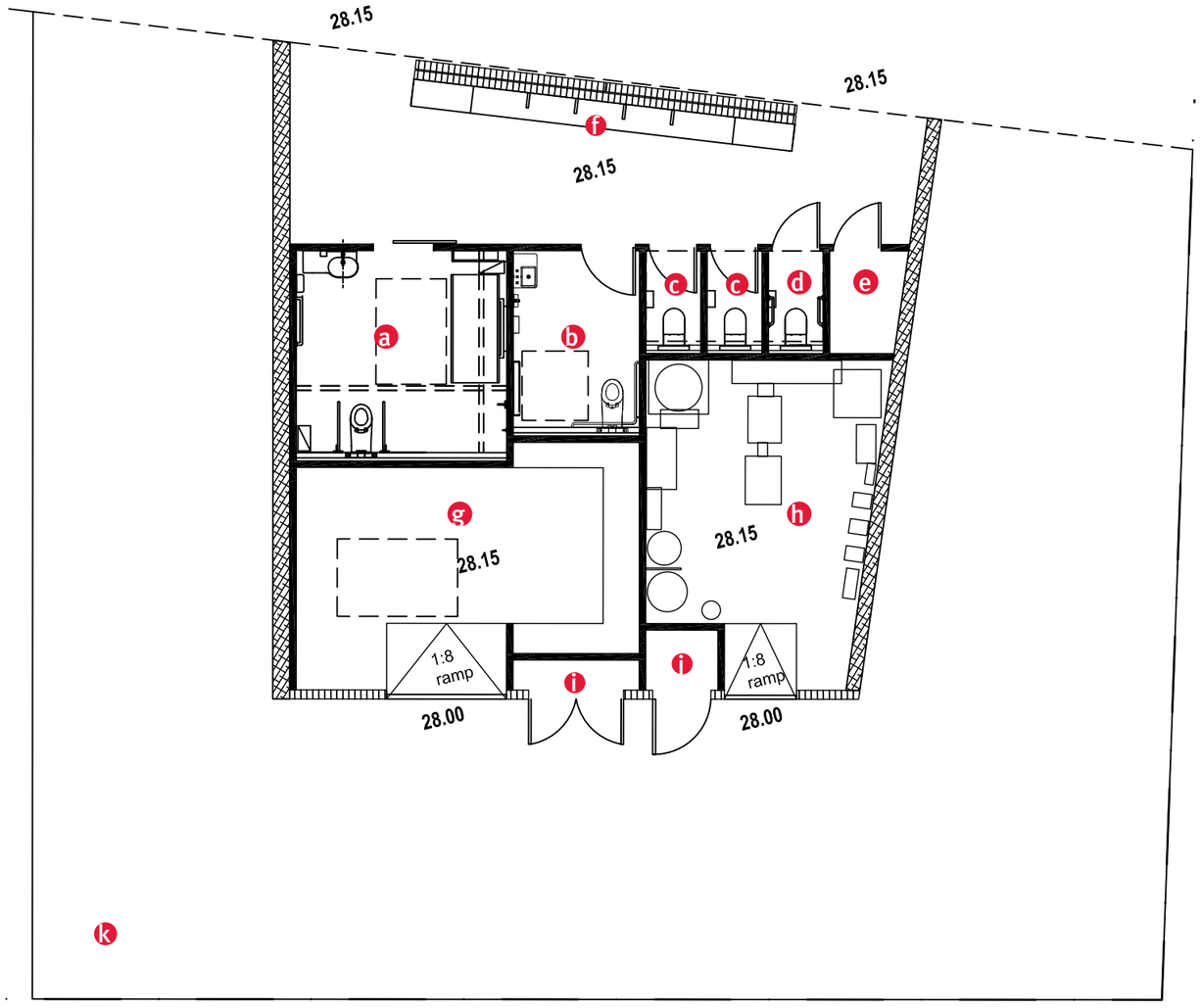


1:500 @ A3

0 5 10 20m

Legend

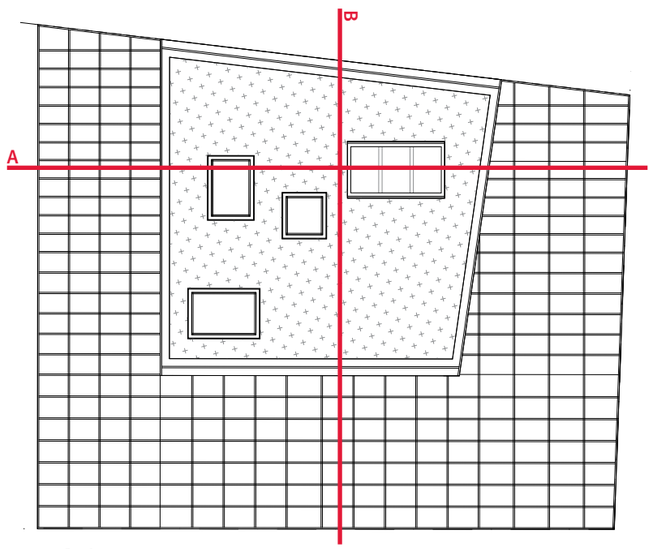
- a Adult change room (1x)
- b Accessible WC (1x)
- c Unisex WC (2x)
- d Ambulant WC (1x)
- e Cleaners Cupboard
- f Basin
- g Store 1 - Maintenance equipment & activation furniture: 20.5m ^{2}
- h Store 2 - Pump room: 17m ^{2}
- i EBD Cupboard
- i Comms Cupboard
- k Pergola



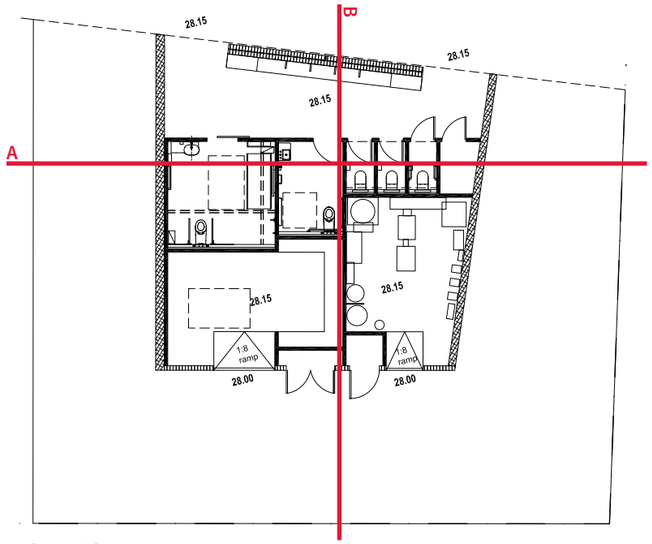
Concept plan - Floor Plan

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Amenities



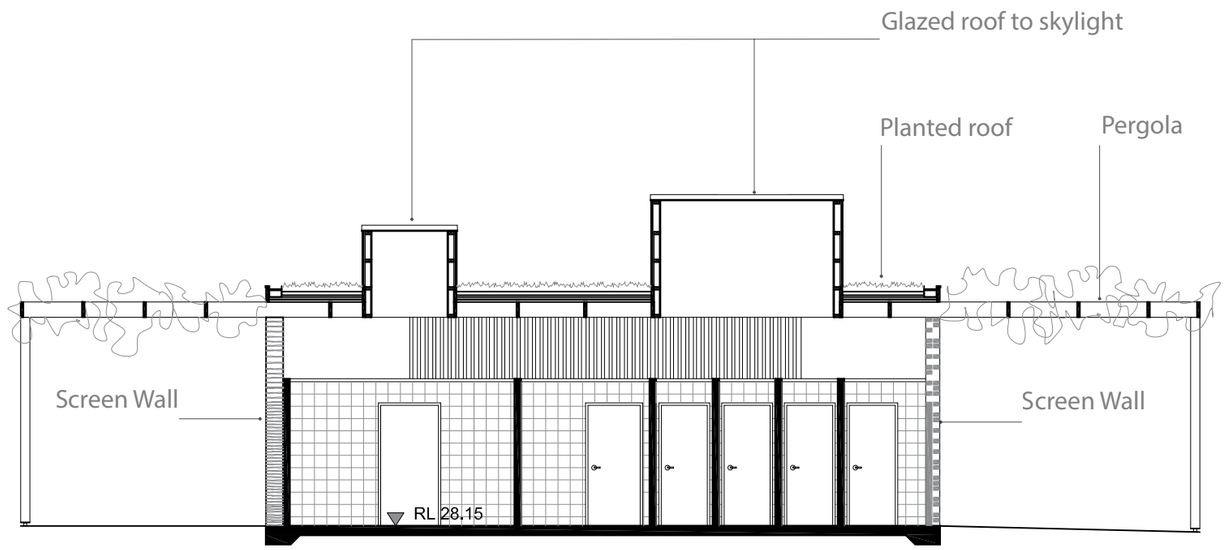
Roof Plan



Floor Plan

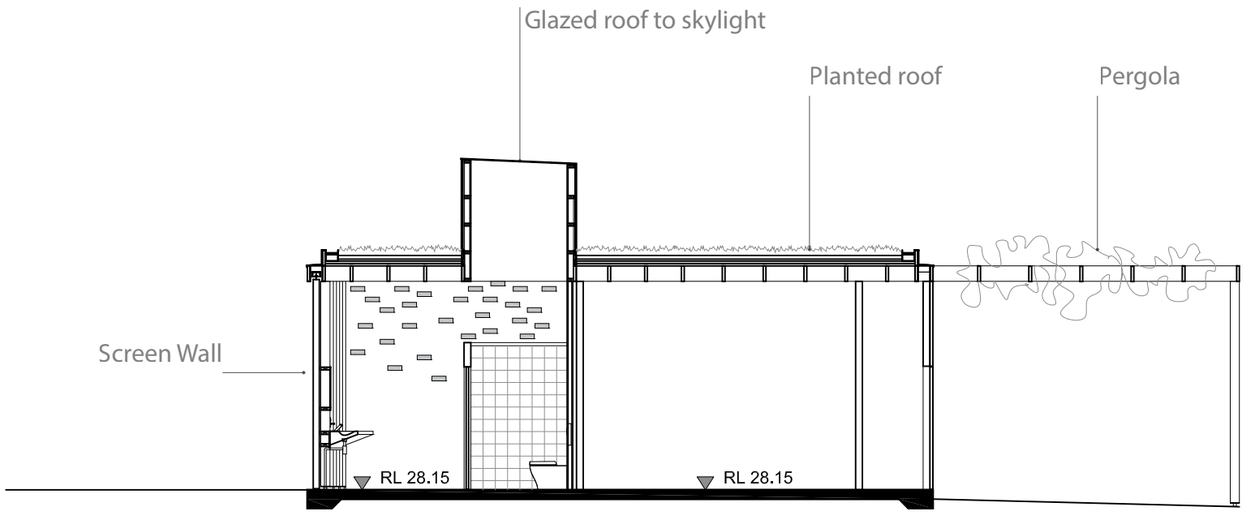
1:100 @ A3

0 0.5 1 2 5m



Section A - East West

0 0.5 1 2m



Section B - North South

0 0.5 1 2m

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Version: 1, Version Date: 14/04/2021

Planting character and accent trees

Gardens

Araucaria columnaris

Eucalyptus tereticornis

Jacaranda mimosifolia

Populus nigra "italica"

Water feature / pond

Rain garden

Lawn

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Materials and built environment - park

Recycled brick

Combination of paving materials

Steel

Opportunities for solar pannels

Fog

Temporary umbrellas

Market stalls in Civic area

Low bridges over rain gardens

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Version: 1, Version Date: 14/04/2021

Mark's Park Amenities building, Waverley by Sam Crawford architects
Timber battens on external façade & external basin

Tamarama Amenities building, Waverley by Lahznimmo Architects
Slidding timber slat doors

Opportunities for re-use of site recycled materials on building façade

Brick screen wall

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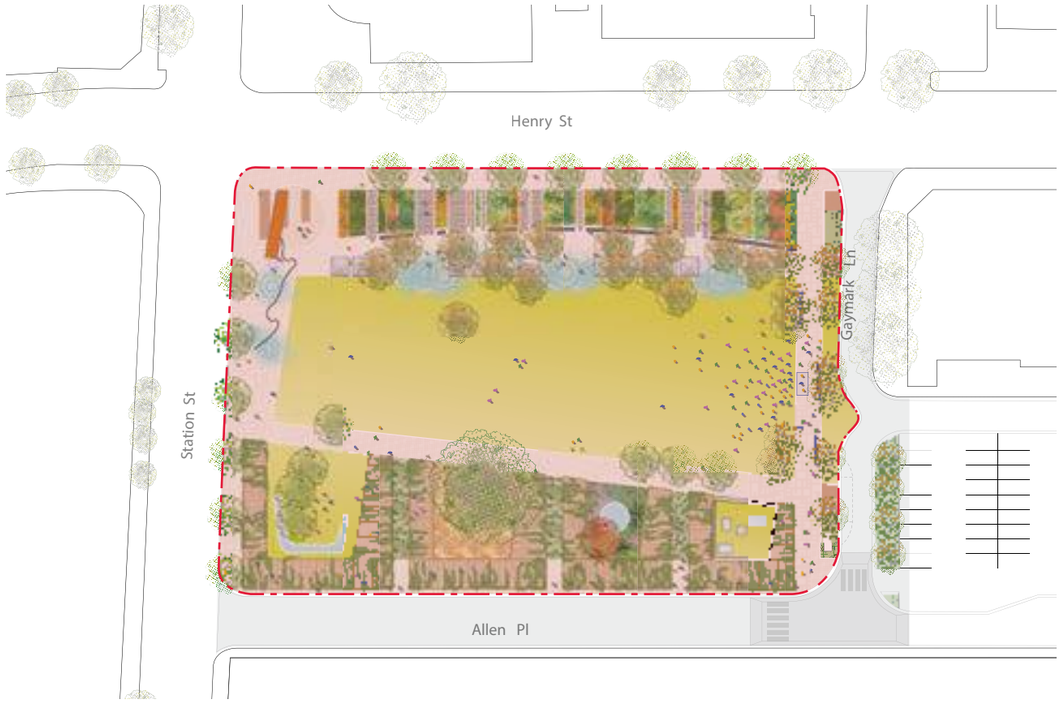
Preliminary Costing

Legend

- EOW - City Park: items 1-24
- EOW - Road Works item 25



1:1000 @ A3

0 10 20 40m

City Park

Item	Description	Total
01	Demolition of existing buildings incl. removal of hazardous materials - by separate works package (excluded)	excluded
02	Demolition - carpark & hardstands	$202,255
03	Site Preparation	$27,554
04	Existing Services	$54,724
05	Ground Contamination	$100,000
06	Earthworks	$10,682
07	Civil Stormwater	$375,000
08	Raingarden	$200,640
09	Concrete Seating	$119,743
10	Pavements & Surface Finishes	$816,102
11	Fixtures & Furniture	$157,800
12	Water Fog/Misting & Water Features	$900,000
13	Amenities Building	$888,750
14	Shade structure (Pergola)	$622,797
15	Vertical Marker/Entrance Statement	$450,000
16	Public Art & Signage	$150,000
17	Landscaping (including irrigation)	$361,909
18	Landscape Establishment Maintenance (12 months)	$81,600
19	Water, Gas, & Sewer Services	$58,900
20	Water Harvest & Re-Use	$545,000
21	Electrical Services (incl. lighting & power, substation, CCTV, Wi-Fi)	$1,012,000
22	Contractors Preliminaries, Overheads & Margin	$998,964
23	Contingency - design & price risk (15%)	$1,012,000
24	Total: Construction Cost (excl. GST)	$9,354,483

Road Works

Item	Description	Total
25	Separate option - Extend Gaymark Lane to Allen Place, widen Allen Place to two lanes, pedestrian crossings, associated stormwater	$641,342

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix D Field Calibration Sheets

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Field Equipment Calibration and Decontamination

PROJECT NAME: PENRITH PARK	**PROJECT NO:** 58140
FIELDWORK DATES: 18/5/20	**SAMPLERS:** MN CB
TYPE OF INVESTIGATION: SUB-SLAB SURVEY	**PROJECT MANAGER:** CB

CALIBRATION SUMMARY

EQUIPMENT: PID	
CALIBRATION STANDARD: 100 ppm Isobutylene	

DATE	TIME	READING (ppm)	COMMENTS
18/5/20	11:00	0	Zero Cal
-	11:01	100 ppm	- bump test completed after 100 ppm calibration and reading was 100ppm.

DECONTAMINATION SUMMARY

EQUIPMENT: N/A – New disposable tubing used for each probe.

1	Was the equipment decontaminated appropriately prior to sampling at each location?	Y	N	NA
2	Was excess soil removed by scraping, brushing or wiping with disposable towels?	Y	N	NA
3	Was the equipment contaminated with grease, tar or similar material?	Y	N	NA
	If so, was the equipment steam cleaned or rinsed with pesticide-grade acetone:hexane?	Y	N	NA
4	Was phosphate-free detergent used to wash the equipment?	Y	N	NA
5	Was the equipment rinsed with clean water?	Y	N	NA
6	Was the equipment then rinsed with deionised water?	Y	N	NA
7	Were all sample containers cleaned and acid or solvent washed prior to sample collection?	Y	N	NA

WERE ANY ADDITIONAL DECONTAMINATION MEASURES REQUIRED? PROVIDE DETAILS

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Version: 1, Version Date: 14/04/2021

Field Equipment Calibration and Decontamination

PROJECT NAME: Penrith	**PROJECT NO:** ~~S~~ 58140
FIELDWORK DATES: 29/5/20	**SAMPLERS:** MW
TYPE OF INVESTIGATION: Soil vapour / Soil sampling	**PROJECT MANAGER:** CB

CALIBRATION SUMMARY

EQUIPMENT: PID
CALIBRATION STANDARD: 100 ppm isobutylene

DATE	TIME	READING (ppm)	COMMENTS
29/5/20	8:00	0	Zero calibration
↓	8:01	100.4	100.0 ppm isobutylene calibration
	8:02	100.1	bump test
30/5/20	9:10	0	Zero calibration
	9:11	100.4	100 ppm isobutylene
	9:12	100.2	bump test

DECONTAMINATION SUMMARY

EQUIPMENT: ~~new pair of nitrile g~~				
1	Was the equipment decontaminated appropriately prior to sampling at each location?	Y	N	NA
2	Was excess soil removed by scraping, brushing or wiping with disposable towels?	Y	N	NA
3	Was the equipment contaminated with grease, tar or similar material?	Y	N	NA
	If so, was the equipment steam cleaned or rinsed with pesticide-grade acetone:hexane?	Y	N	NA
4	Was phosphate-free detergent used to wash the equipment?	Y	N	NA
5	Was the equipment rinsed with clean water?	Y	N	NA
6	Was the equipment then rinsed with deionised water?	Y	N	NA
7	Were all sample containers cleaned and acid or solvent washed prior to sample collection?	Y	N	NA
WERE ANY ADDITIONAL DECONTAMINATION MEASURES REQUIRED? PROVIDE DETAILS				
new pair of nitrile gloves for every sample collected. new tubing used for soil vapours				

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ANRI INSTRUMENTS & CONTROLS PTY LTD ABN 21 004 771 564

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EMAIL: sales@anri.com.au www.anri.com.au

Date: 11.5.20

Attn: Mr. A. Boardman
JBS&G Australia Pty. Ltd.
Suite 1A, 280-286 Keira Street
Wollongong
NSW 2530

Ref. O/N 10000

Calibration Certificate # 5096

Manufacture/Model	: Gas Data GFM435
S/N	: 12022
Gases Monitored	: CH4, 0-100%, CO2 0-100%, O2 0-25%, H2S & CO
Zero setting CH4/CO2/O2/H2S/CO	: 0.0
Gas used	: N2
Cylinder No.	: BOC High Purity
Span setting CH4	: 60.0%
Gas used	: 60.0% CH4 in CO2
Cylinder No.	: Air Liquide 72927 (NATA)
60.0% CH4 in CO2 reads	: 59.9%
5.1% CH4 in CO2 reads	: 4.8%
Span setting CO2	: 40.0%
Gas used	: 40.0% CO2 in CH4
Cylinder No.	: Air Liquide 72927 (NATA)
40.0% CO2 in CH4 reads	: 40.1%
5.2% CO2 in CH4	: 4.9%
Span setting O2	: 20.9% (Air) Reads 20.9%
Span setting 25ppm H2S reads	: 25ppm
Span setting 1100ppm CO reads	: 1122ppm
Hexane	: Factory setting
Cells replaced	: Oxygen
Estimated Date of cell replacement	: Oxygen 11/5/22
Comments	: Calibration OK
Flow rate	: 550ml/min. OK
Atm. Pressure 1008mb	: 1010mb
Next Service/calibration Due	: 11/5/21

Stephen Hurst
ANRI Instruments & Controls Pty Ltd

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix E Laboratory Reports and Chain of Custody Documentation

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Chris Bielby**

Report **720161-A**
Project name PENRITH PARK
Project ID 58140
Received Date May 18, 2020

Client Sample ID			**SS01 (FRONT)**	**SS01 (BACK)**	**SS02 (FRONT)**	**SS02 (BACK)**
Sample Matrix			**Air**	**Air**	**Air**	**Air**
Eurofins Sample No.			**S20-My25993**	**S20-My25994**	**S20-My25995**	**S20-My25996**
Date Sampled			**May 18, 2020**	**May 18, 2020**	**May 18, 2020**	**May 18, 2020**
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	1.0	< 0.5	1.2	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	1.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SS01 (FRONT)	SS01 (BACK)	SS02 (FRONT)	SS02 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-My25993	S20-My25994	S20-My25995	S20-My25996
Date Sampled			May 18, 2020	May 18, 2020	May 18, 2020	May 18, 2020
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	120	< 0.5	67	< 0.5
Toluene	0.5	Total ug	0.8	< 0.5	0.9	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	18	< 0.5	5.4	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total*	1.5	Total ug	3.6	< 1.5	4.1	< 1.5
Fluorobenzene (surr.)	1	%	91	99	92	101
4-Bromofluorobenzene (surr.)	1	%	103	103	102	103
Dibromofluoromethane (surr.)	1	%	104	104	104	105
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SS03 (FRONT)	SS03 (BACK)	SS04 (FRONT)	SS04 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-My25997	S20-My25998	S20-My25999	S20-My26000
Date Sampled			May 18, 2020	May 18, 2020	May 18, 2020	May 18, 2020
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	0.9	< 0.5	1.2	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SS03 (FRONT)	SS03 (BACK)	SS04 (FRONT)	SS04 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-My25997	S20-My25998	S20-My25999	S20-My26000
Date Sampled			May 18, 2020	May 18, 2020	May 18, 2020	May 18, 2020
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	4.6	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	17	< 0.5	160	< 0.5
Toluene	0.5	Total ug	1.0	< 0.5	0.9	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	1.3	< 0.5	12	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total*	1.5	Total ug	3.8	< 1.5	3.9	< 1.5
Fluorobenzene (surr.)	1	%	98	98	96	106
4-Bromofluorobenzene (surr.)	1	%	104	102	97	102
Dibromofluoromethane (surr.)	1	%	105	104	97	105
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SS05 (FRONT)	SS05 (BACK)	SS06 (FRONT)	SS06 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-My26001	S20-My26002	S20-My26003	S20-My26004
Date Sampled			May 18, 2020	May 18, 2020	May 18, 2020	May 18, 2020
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Client Sample ID			SS05 (FRONT)	SS05 (BACK)	SS06 (FRONT)	SS06 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-My26001	S20-My26002	S20-My26003	S20-My26004
Date Sampled			May 18, 2020	May 18, 2020	May 18, 2020	May 18, 2020
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	0.7	< 0.5	0.7	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	8.5	< 0.5	1.2	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	230	< 0.5	64	< 0.5
Toluene	0.5	Total ug	0.7	< 0.5	0.7	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	12	< 0.5	1.7	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total*	1.5	Total ug	2.6	< 1.5	2.7	< 1.5
Fluorobenzene (surr.)	1	%	96	105	106	105
4-Bromofluorobenzene (surr.)	1	%	96	101	103	101
Dibromofluoromethane (surr.)	1	%	97	106	106	106
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SS05 (FRONT)	SS05 (BACK)	SS06 (FRONT)	SS06 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-My26001	S20-My26002	S20-My26003	S20-My26004
Date Sampled			May 18, 2020	May 18, 2020	May 18, 2020	May 18, 2020
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SS07 (FRONT)	SS07 (BACK)	SS08 (FRONT)	SS08 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-My26005	S20-My26006	S20-My26007	S20-My26008
Date Sampled			May 18, 2020	May 18, 2020	May 18, 2020	May 18, 2020
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	0.5	< 0.5	1.4	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	8.1	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	0.7	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SS07 (FRONT)	SS07 (BACK)	SS08 (FRONT)	SS08 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-My26005	S20-My26006	S20-My26007	S20-My26008
Date Sampled			May 18, 2020	May 18, 2020	May 18, 2020	May 18, 2020
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	85	< 0.5	210	< 0.5
Toluene	0.5	Total ug	0.5	< 0.5	1.2	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	1.8	< 0.5	15	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total*	1.5	Total ug	1.5	< 1.5	5.1	< 1.5
Fluorobenzene (surr.)	1	%	106	105	96	105
4-Bromofluorobenzene (surr.)	1	%	103	101	97	101
Dibromofluoromethane (surr.)	1	%	106	106	97	106
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SS09 (FRONT)	SS09 (BACK)	QC01 (FRONT)	QC01 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-My26009	S20-My26010	S20-My26011	S20-My26012
Date Sampled			May 18, 2020	May 18, 2020	May 18, 2020	May 18, 2020
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	1.2	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SS09 (FRONT)	SS09 (BACK)	QC01 (FRONT)	QC01 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-My26009	S20-My26010	S20-My26011	S20-My26012
Date Sampled			May 18, 2020	May 18, 2020	May 18, 2020	May 18, 2020
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	3.5	< 0.5	8.4	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	63	< 0.5	230	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	0.7	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	5.2	< 0.5	16	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total*	1.5	Total ug	< 1.5	< 1.5	3.5	< 1.5
Fluorobenzene (surr.)	1	%	107	106	94	106
4-Bromofluorobenzene (surr.)	1	%	103	101	96	101
Dibromofluoromethane (surr.)	1	%	106	106	96	106
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			EB (FRONT)	EB (BACK)
Sample Matrix			Air	Air
Eurofins Sample No.			S20-My26013	S20-My26014
Date Sampled			May 18, 2020	May 18, 2020
Test/Reference	LOR	Unit		
Isopropanol	10	Total ug	< 10	< 10
VOCs in Ambient Air by GC/MS				
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5

Client Sample ID			EB (FRONT)	EB (BACK)
Sample Matrix			Air	Air
Eurofins Sample No.			S20-My26013	S20-My26014
Date Sampled			May 18, 2020	May 18, 2020
Test/Reference	LOR	Unit		
VOCs in Ambient Air by GC/MS				
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5
Naphthalene	0.5	Total ug	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	< 0.5	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5
Xylenes - Total*	1.5	Total ug	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	106	104
4-Bromofluorobenzene (surr.)	1	%	102	101
Dibromofluoromethane (surr.)	1	%	106	106
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Isopropanol	Melbourne	May 18, 2020	14 Days
- Method: LTM-ORG-2030 VOCs in Ambient Air by GC/MS			
VOCs in Ambient Air by GC/MS	Melbourne	May 18, 2020	14 Days
- Method: LTM-ORG-2030 VOCs in Ambient Air by GC/MS			

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Site # 1254 & 14271

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16 Mars Road
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Phone : +61 2 9900 8400
NATA # 1261 Site # 18217

Brisbane
1/21 Smallwood Place
Murarrie QLD 4172
Phone : +61 7 3902 4600
NATA # 1261 Site # 20794

Perth
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Kewdale WA 6105
Phone : +61 8 9251 9600
NATA # 1261
Site # 23736

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Phone : +64 9 526 45 51
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Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH PARK
Project ID: 58140

Order No.:
Report #: 720161
Phone: 02 8245 0300
Fax:

Received: May 18, 2020 5:08 PM
Due: May 25, 2020
Priority: 5 Day
Contact Name: Chris Bielby

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Isopropanol	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SS01 (FRONT)	May 18, 2020		Air	S20-My25993	X	X
2	SS01 (BACK)	May 18, 2020		Air	S20-My25994	X	X
3	SS02 (FRONT)	May 18, 2020		Air	S20-My25995	X	X
4	SS02 (BACK)	May 18, 2020		Air	S20-My25996	X	X
5	SS03 (FRONT)	May 18, 2020		Air	S20-My25997	X	X
6	SS03 (BACK)	May 18, 2020		Air	S20-My25998	X	X
7	SS04 (FRONT)	May 18, 2020		Air	S20-My25999	X	X

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Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
8	SS04 (BACK)	May 18, 2020		Air	S20-My26000	X	X
9	SS05 (FRONT)	May 18, 2020		Air	S20-My26001	X	X
10	SS05 (BACK)	May 18, 2020		Air	S20-My26002	X	X
11	SS06 (FRONT)	May 18, 2020		Air	S20-My26003	X	X
12	SS06 (BACK)	May 18, 2020		Air	S20-My26004	X	X
13	SS07 (FRONT)	May 18, 2020		Air	S20-My26005	X	X
14	SS07 (BACK)	May 18, 2020		Air	S20-My26006	X	X
15	SS08 (FRONT)	May 18, 2020		Air	S20-My26007	X	X
16	SS08 (BACK)	May 18, 2020		Air	S20-My26008	X	X
17	SS09	May 18, 2020		Air	S20-My26009	X	X

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
	(FRONT)						
18	SS09 (BACK)	May 18, 2020		Air	S20-My26010	X	X
19	QC01 (FRONT)	May 18, 2020		Air	S20-My26011	X	X
20	QC01 (BACK)	May 18, 2020		Air	S20-My26012	X	X
21	EB (FRONT)	May 18, 2020		Air	S20-My26013	X	X
22	EB (BACK)	May 18, 2020		Air	S20-My26014	X	X
Test Counts						22	22

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram | **mg/L:** milligrams per litre | **ug/L:** micrograms per litre

ppm: Parts per million | **ppb:** Parts per billion | **%:** Percentage

org/100mL: Organisms per 100 millilitres | **NTU:** Nephelometric Turbidity Units | **MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Isopropanol	Total ug	< 10			10	Pass	
Method Blank							
VOCs in Ambient Air by GC/MS							
1.1-Dichloroethane	Total ug	< 0.5			0.5	Pass	
1.1-Dichloroethene	Total ug	< 0.5			0.5	Pass	
1.1-Dichloropropene	Total ug	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	Total ug	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	Total ug	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	Total ug	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	Total ug	< 0.5			0.5	Pass	
1.2-Dibromo-3-chloropropane	Total ug	< 0.5			0.5	Pass	
1.2-Dibromoethane	Total ug	< 0.5			0.5	Pass	
1.2-Dichloroethane	Total ug	< 0.5			0.5	Pass	
1.2-Dichloropropane	Total ug	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	Total ug	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	Total ug	< 0.5			0.5	Pass	
1.3-Dichloropropane	Total ug	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	Total ug	< 0.5			0.5	Pass	
2-Chlorotoluene	Total ug	< 0.5			0.5	Pass	
2.2-Dichloropropane	Total ug	< 0.5			0.5	Pass	
4-Chlorotoluene	Total ug	< 0.5			0.5	Pass	
Benzene	Total ug	< 0.5			0.5	Pass	
Bromochloromethane	Total ug	< 0.5			0.5	Pass	
Bromodichloromethane	Total ug	< 0.5			0.5	Pass	
Bromoform	Total ug	< 0.5			0.5	Pass	
Carbon Tetrachloride	Total ug	< 0.5			0.5	Pass	
Chlorobenzene	Total ug	< 0.5			0.5	Pass	
Chloroform	Total ug	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	Total ug	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	Total ug	< 0.5			0.5	Pass	
Dibromochloromethane	Total ug	< 0.5			0.5	Pass	
Dibromomethane	Total ug	< 0.5			0.5	Pass	
Ethylbenzene	Total ug	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	Total ug	< 0.5			0.5	Pass	
n-Butylbenzene	Total ug	< 0.5			0.5	Pass	
n-Propylbenzene	Total ug	< 0.5			0.5	Pass	
Naphthalene	Total ug	< 0.5			0.5	Pass	
p-Isopropyltoluene	Total ug	< 0.5			0.5	Pass	
sec-Butylbenzene	Total ug	< 0.5			0.5	Pass	
Styrene	Total ug	< 5			5	Pass	
tert-Butylbenzene	Total ug	< 0.5			0.5	Pass	
Tetrachloroethene	Total ug	< 0.5			0.5	Pass	
Toluene	Total ug	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	Total ug	< 0.5			0.5	Pass	
Trichloroethene	Total ug	< 0.5			0.5	Pass	
Trichlorofluoromethane	Total ug	< 0.5			0.5	Pass	
Vinyl chloride	Total ug	< 0.5			0.5	Pass	
Xylenes - Total*	Total ug	< 1.5			1.5	Pass	
1.2-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.2.3-Trichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.2.4-Trichlorobenzene	Total ug	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.3-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
Hexachlorobutadiene	Total ug	< 0.5			0.5	Pass	
LCS - % Recovery							
Isopropanol	%	125			70-130	Pass	
LCS - % Recovery							
VOCs in Ambient Air by GC/MS							
1.1-Dichloroethene	%	91			70-130	Pass	
1.1-Dichloropropene	%	99			70-130	Pass	
1.1.1-Trichloroethane	%	100			70-130	Pass	
1.2-Dibromo-3-chloropropane	%	114			75-125	Pass	
1.2-Dichloroethane	%	99			70-130	Pass	
Benzene	%	103			70-130	Pass	
Ethylbenzene	%	112			70-130	Pass	
Toluene	%	105			70-130	Pass	
Trichloroethene	%	100			70-130	Pass	
Xylenes - Total*	%	105			70-130	Pass	
1.2-Dichlorobenzene	%	100			70-130	Pass	
1.2.3-Trichlorobenzene	%	84			70-130	Pass	
1.2.4-Trichlorobenzene	%	93			70-130	Pass	
1.4-Dichlorobenzene	%	107			70-130	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	No
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Ursula Long	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Sample Receipt Advice

Company name:	**JBS & G Australia (NSW) P/L**
Contact name:	Chris Bielby
Project name:	PENRITH PARK
Project ID:	58140
COC number:	Not provided
Turn around time:	5 Day
Date/Time received:	May 18, 2020 5:08 PM
Eurofins reference:	**720161**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☒ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Ursula Long on Phone : or by e.mail: UrsulaLong@eurofins.com

Results will be delivered electronically via e.mail to Chris Bielby - cbielby@jbsg.com.au.

EUROFINS.

Chain of Custody

JBS&G

PROJECT NO.: 58140	LABORATORY BATCH NO.: 720161
PROJECT NAME: PENRITH PARK	SAMPLERS: CB MN
DATE NEEDED BY: STANDARD	QC LEVEL: NEPM (2013)

PHONE: Sydney 02 8245 0300 | Perth 08 9488 0100 | Brisbane 07 3211 5350 | Melbourne 03 9642 0599 | Adelaide 08 8431 7113

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) .....@jbsg.com.au; (3) .....@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	VOC 8260	Isopropanol	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
SS01	GAS	18/5/20		SORBENT TUBE		/	/			
SS02						/	/			
SS03						/	/			
SS04						/	/			
SS05						/	/			
SS06						/	/			
SS07						/	/			
SS08						/	/			
SS09						/	/			
~~QC01~~ QC01						/	/			
EB						/	/			

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: CBIEBY DATE: 18/5/20	CONSIGNMENT NOTE NO.	NAME: Grace	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 19/5	
		OF: Eurofins	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

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CERTIFICATE OF ANALYSIS 243115

Client Details

Client	JBS & G (NSW & WA) Pty Ltd
Attention	Chris Bielby
Address	Level 1, 50 Margaret St, Sydney, NSW, 2000

Sample Details

Your Reference	**58140, Penrith Park**
Number of Samples	1 carbon tube
Date samples received	18/05/2020
Date completed instructions received	18/05/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Report Details

Date results requested by	25/05/2020
Date of Issue	22/05/2020

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Results Approved By
Josh Williams, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

VOC in Carbon tubes		
Our Reference		243115-1
Your Reference	UNITS	QA01
Date Sampled		18/05/2020
Type of sample		carbon tube
Date extracted	-	20/05/2020
Date analysed	-	20/05/2020
Isopropyl Alcohol*	µg/tube	<5
Acetone	µg/tube	<5
Acrylonitrile	µg/tube	<5
Methylethylketone (MEK)	µg/tube	<5
Hexane	µg/tube	<5
Ethylacetate	µg/tube	<5
1,2-Dichloroethane	µg/tube	<5
Benzene	µg/tube	<2
Carbon Tetrachloride	µg/tube	<5
Cyclohexane	µg/tube	<5
Ethylacrylate	µg/tube	<5
Trichloroethene	µg/tube	<5
1,4-Dioxane	µg/tube	<5
Propylene Oxide	µg/tube	<10
Epichlorohydrin	µg/tube	<5
Methylisobutylketone (MIBK)	µg/tube	<5
Toluene	µg/tube	<5
Tetrachloroethene	µg/tube	43
n-Butylacetate	µg/tube	<5
Chlorobenzene	µg/tube	<5
Ethylbenzene	µg/tube	<5
m+p-Xylene	µg/tube	<10
Styrene	µg/tube	<5
o-Xylene	µg/tube	<5
Cyclohexanone	µg/tube	<5
Nonane	µg/tube	<5
Isopropylbenzene	µg/tube	<5
Diisobutylketone (DIBK)	µg/tube	<5
a-Methylstyrene	µg/tube	<5
Decane	µg/tube	<5
Benzylchloride	µg/tube	<5
Naphthalene	µg/tube	<5
Dodecane	µg/tube	<5
TVOC's as hexane in tubes*	µg/tube	60

VOC in Carbon tubes		
Our Reference		243115-1
Your Reference	UNITS	QA01
Date Sampled		18/05/2020
Type of sample		carbon tube
Surrogate Toluene-d8	%	92
Surrogate 4-Bromofluorobenzene	%	86

Method ID	Methodology Summary
ORG-022	Determination of volatile organic compounds in charcoal tubes/badges/sorbents using CS2 extraction, based on NIOSH methods using GC/GC-MS. Desorption efficiencies are not applied to results in ug/tube. Note where µg/m^3 results are supplied for SKC badges, the factors used are for 575-001, if 575-001 data is unavailable for an analyte then use 575-002 then 575-003 (exposure time must be supplied).

QUALITY CONTROL: VOC in Carbon tubes					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			20/05/2020	[NT]	[NT]	[NT]	[NT]	20/05/2020	[NT]
Date analysed	-			20/05/2020	[NT]	[NT]	[NT]	[NT]	20/05/2020	[NT]
Isopropyl Alcohol*	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	97	[NT]
Acetone	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	114	[NT]
Acrylonitrile	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	98	[NT]
Methylethylketone (MEK)	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	93	[NT]
Hexane	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	91	[NT]
Ethylacetate	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	94	[NT]
1,2-Dichloroethane	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	93	[NT]
Benzene	µg/tube	2	ORG-022	<2	[NT]	[NT]	[NT]	[NT]	92	[NT]
Carbon Tetrachloride	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	94	[NT]
Cyclohexane	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	93	[NT]
Ethylacrylate	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	94	[NT]
Trichloroethene	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	94	[NT]
1,4-Dioxane	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	93	[NT]
Propylene Oxide	µg/tube	10	ORG-022	<10	[NT]	[NT]	[NT]	[NT]	105	[NT]
Epichlorohydrin	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	93	[NT]
Methylisobutylketone (MIBK)	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	96	[NT]
Toluene	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	98	[NT]
Tetrachloroethene	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	99	[NT]
n-Butylacetate	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	99	[NT]
Chlorobenzene	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	92	[NT]
Ethylbenzene	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	93	[NT]
m+p-Xylene	µg/tube	10	ORG-022	<10	[NT]	[NT]	[NT]	[NT]	93	[NT]
Styrene	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	93	[NT]
o-Xylene	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	91	[NT]
Cyclohexanone	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	91	[NT]
Nonane	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	90	[NT]
Isopropylbenzene	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	93	[NT]
Diisobutylketone (DIBK)	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	95	[NT]
a-Methylstyrene	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	96	[NT]
Decane	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	92	[NT]
Benzylchloride	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	94	[NT]
Naphthalene	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	94	[NT]
Dodecane	µg/tube	5	ORG-022	<5	[NT]	[NT]	[NT]	[NT]	94	[NT]
TVOC's as hexane in tubes*	µg/tube	50	ORG-022	<50	[NT]	[NT]	[NT]	[NT]	91	[NT]
Surrogate Toluene-d8	%		ORG-022	96	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate 4-Bromofluorobenzene	%		ORG-022	87	[NT]	[NT]	[NT]	[NT]	92	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

ENVIROLAB

Chain of Custody

JBS&G

PROJECT NO.: 58140
PROJECT NAME: PLENRITH PARK
DATE NEEDED BY: STANDARD

LABORATORY BATCH NO.:
SAMPLERS: CB KM

QC LEVEL: NEPM (2013)

PHONE: Sydney 02 8245 0300 | Perth 08 9488 0100 | Brisbane 07 3112 2688 | Melbourne 03 9642 0599 | Adelaide 08 8431 7113

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) .....@jbsg.com.au; (3) .....@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

	SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	VOCs #2566	ISOPROPANOL	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
1	QA01	GAS	18/5/20		SORBENT TUBE		1	1			

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 193115
Date Received: 18/5/20
Time Received: 15:00
Received By: EL
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: C.BIGGS DATE: 18/5/20	CONSIGNMENT NOTE NO.	NAME: DATE: 18/5/20	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	OF: EL	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
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NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Chris Bielby**

Report **722975-A**
Project name PENRITH SOIL VAPOUR
Project ID 58140
Received Date Jun 01, 2020

Client Sample ID			**SV10-A (FRONT)**	**SV10-A (BACK)**	**SV10-B (FRONT)**	**SV10-B (BACK)**
Sample Matrix			**Air**	**Air**	**Air**	**Air**
Eurofins Sample No.			**S20-Jn01487**	**S20-Jn01488**	**S20-Jn01489**	**S20-Jn01490**
Date Sampled			**May 30, 2020**	**May 30, 2020**	**May 30, 2020**	**May 30, 2020**
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	1.4	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	1.2	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV10-A (FRONT)	SV10-A (BACK)	SV10-B (FRONT)	SV10-B (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-Jn01487	S20-Jn01488	S20-Jn01489	S20-Jn01490
Date Sampled			May 30, 2020	May 30, 2020	May 30, 2020	May 30, 2020
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	< 0.5	< 0.5	35	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	0.8	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5	7.7	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total*	1.5	Total ug	< 1.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	111	118	112	119
4-Bromofluorobenzene (surr.)	1	%	90	106	90	98
Dibromofluoromethane (surr.)	1	%	108	109	107	107
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV11-A (FRONT)	SV11-A (BACK)	SV11-B (FRONT)	SV11-B (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-Jn01491	S20-Jn01492	S20-Jn01493	S20-Jn01494
Date Sampled			May 30, 2020	May 30, 2020	May 30, 2020	May 30, 2020
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	36	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV11-A (FRONT)	SV11-A (BACK)	SV11-B (FRONT)	SV11-B (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-Jn01491	S20-Jn01492	S20-Jn01493	S20-Jn01494
Date Sampled			May 30, 2020	May 30, 2020	May 30, 2020	May 30, 2020
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	1.2	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	31	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	< 0.5	< 0.5	390	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	0.6	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5	22	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total*	1.5	Total ug	< 1.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	109	118	109	118
4-Bromofluorobenzene (surr.)	1	%	88	106	89	108
Dibromofluoromethane (surr.)	1	%	107	108	107	109
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV12 (FRONT)	SV12 (BACK)	SV13 (FRONT)	SV13 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-Jn01495	S20-Jn01496	S20-Jn01497	S20-Jn01498
Date Sampled			May 30, 2020	May 30, 2020	May 30, 2020	May 30, 2020
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total*	1.5	Total ug	< 1.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	107	122	107	121
4-Bromofluorobenzene (surr.)	1	%	88	98	88	107

Client Sample ID			SV12 (FRONT)	SV12 (BACK)	SV13 (FRONT)	SV13 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-Jn01495	S20-Jn01496	S20-Jn01497	S20-Jn01498
Date Sampled			May 30, 2020	May 30, 2020	May 30, 2020	May 30, 2020
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
Dibromofluoromethane (surr.)	1	%	109	106	108	109
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV14 (FRONT)	SV14 (BACK)	SV15 (FRONT)	SV15 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-Jn01499	S20-Jn01500	S20-Jn01501	S20-Jn01502
Date Sampled			May 30, 2020	May 30, 2020	May 30, 2020	May 30, 2020
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV14 (FRONT)	SV14 (BACK)	SV15 (FRONT)	SV15 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-Jn01499	S20-Jn01500	S20-Jn01501	S20-Jn01502
Date Sampled			May 30, 2020	May 30, 2020	May 30, 2020	May 30, 2020
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total*	1.5	Total ug	< 1.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	108	120	109	117
4-Bromofluorobenzene (surr.)	1	%	90	97	89	106
Dibromofluoromethane (surr.)	1	%	106	108	108	106
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV16 (FRONT)	SV16 (BACK)	SV17 (FRONT)	SV17 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-Jn01503	S20-Jn01504	S20-Jn01505	S20-Jn01506
Date Sampled			May 30, 2020	May 30, 2020	May 30, 2020	May 30, 2020
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10
VOCs in Ambient Air by GC/MS						
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV16 (FRONT)	SV16 (BACK)	SV17 (FRONT)	SV17 (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-Jn01503	S20-Jn01504	S20-Jn01505	S20-Jn01506
Date Sampled			May 30, 2020	May 30, 2020	May 30, 2020	May 30, 2020
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total*	1.5	Total ug	< 1.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	110	117	111	118
4-Bromofluorobenzene (surr.)	1	%	89	105	89	107
Dibromofluoromethane (surr.)	1	%	108	109	108	109
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV18 (FRONT)	SV18 (BACK)	FB (FRONT)	FB (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-Jn01507	S20-Jn01508	S20-Jn01509	S20-Jn01510
Date Sampled			May 30, 2020	May 30, 2020	May 30, 2020	May 30, 2020
Test/Reference	LOR	Unit				
Isopropanol	10	Total ug	< 10	< 10	< 10	< 10

Client Sample ID			SV18 (FRONT)	SV18 (BACK)	FB (FRONT)	FB (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-Jn01507	S20-Jn01508	S20-Jn01509	S20-Jn01510
Date Sampled			May 30, 2020	May 30, 2020	May 30, 2020	May 30, 2020
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
1.1-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromo-3-chloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
2.2-Dichloropropane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
n-Propylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Naphthalene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
p-Isopropyltoluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
sec-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Styrene	5	Total ug	< 5	< 5	< 5	< 5
tert-Butylbenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total*	1.5	Total ug	< 1.5	< 1.5	< 1.5	< 1.5
Fluorobenzene (surr.)	1	%	108	117	106	117
4-Bromofluorobenzene (surr.)	1	%	88	99	87	107
Dibromofluoromethane (surr.)	1	%	106	108	106	109
1.2-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV18 (FRONT)	SV18 (BACK)	FB (FRONT)	FB (BACK)
Sample Matrix			Air	Air	Air	Air
Eurofins Sample No.			S20-Jn01507	S20-Jn01508	S20-Jn01509	S20-Jn01510
Date Sampled			May 30, 2020	May 30, 2020	May 30, 2020	May 30, 2020
Test/Reference	LOR	Unit				
VOCs in Ambient Air by GC/MS						
1.2.3-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5
Hexachlorobutadiene	0.5	Total ug	< 0.5	< 0.5	< 0.5	< 0.5

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Isopropanol	Melbourne	Jun 01, 2020	14 Days
- Method: LTM-ORG-2030 VOCs in Ambient Air by GC/MS			
VOCs in Ambient Air by GC/MS	Melbourne	Jun 01, 2020	14 Days
- Method: LTM-ORG-2030 VOCs in Ambient Air by GC/MS			

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NATA # 1261 Site # 18217

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NATA # 1261 Site # 20794

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Rolleston, Christchurch 7675
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IANZ # 1290

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH SOIL VAPOUR
Project ID: 58140

Order No.:
Report #: 722975
Phone: 02 8245 0300
Fax:

Received: Jun 1, 2020 4:58 PM
Due: Jun 3, 2020
Priority: 2 Day
Contact Name: Chris Bielby

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Isopropanol	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
External Laboratory							
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**		
1	SV10-A (FRONT)	May 30, 2020		Air	S20-Jn01487	X	X
2	SV10-A (BACK)	May 30, 2020		Air	S20-Jn01488	X	X
3	SV10-B (FRONT)	May 30, 2020		Air	S20-Jn01489	X	X
4	SV10-B (BACK)	May 30, 2020		Air	S20-Jn01490	X	X
5	SV11-A (FRONT)	May 30, 2020		Air	S20-Jn01491	X	X
6	SV11-A (BACK)	May 30, 2020		Air	S20-Jn01492	X	X

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
7	SV11-B (FRONT)	May 30, 2020		Air	S20-Jn01493	X	X
8	SV11-B (BACK)	May 30, 2020		Air	S20-Jn01494	X	X
9	SV12 (FRONT)	May 30, 2020		Air	S20-Jn01495	X	X
10	SV12 (BACK)	May 30, 2020		Air	S20-Jn01496	X	X
11	SV13 (FRONT)	May 30, 2020		Air	S20-Jn01497	X	X
12	SV13 (BACK)	May 30, 2020		Air	S20-Jn01498	X	X
13	SV14 (FRONT)	May 30, 2020		Air	S20-Jn01499	X	X
14	SV14 (BACK)	May 30, 2020		Air	S20-Jn01500	X	X
15	SV15 (FRONT)	May 30, 2020		Air	S20-Jn01501	X	X

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

eurofins | Environment Testing

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Sample Detail						Isopropanol	VOCs in Ambient Air by GC/MS
Melbourne Laboratory - NATA Site # 1254 & 14271						X	X
Sydney Laboratory - NATA Site # 18217							
Brisbane Laboratory - NATA Site # 20794							
Perth Laboratory - NATA Site # 23736							
16	SV15 (BACK)	May 30, 2020		Air	S20-Jn01502	X	X
17	SV16 (FRONT)	May 30, 2020		Air	S20-Jn01503	X	X
18	SV16 (BACK)	May 30, 2020		Air	S20-Jn01504	X	X
19	SV17 (FRONT)	May 30, 2020		Air	S20-Jn01505	X	X
20	SV17 (BACK)	May 30, 2020		Air	S20-Jn01506	X	X
21	SV18 (FRONT)	May 30, 2020		Air	S20-Jn01507	X	X
22	SV18 (BACK)	May 30, 2020		Air	S20-Jn01508	X	X
23	FB (FRONT)	May 30, 2020		Air	S20-Jn01509	X	X
24	FB (BACK)	May 30, 2020		Air	S20-Jn01510	X	X
Test Counts						24	24

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram | **mg/L:** milligrams per litre | **ug/L:** micrograms per litre

ppm: Parts per million | **ppb:** Parts per billion | **%:** Percentage

org/100mL: Organisms per 100 millilitres | **NTU:** Nephelometric Turbidity Units | **MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Isopropanol	Total ug	< 10			10	Pass	
Method Blank							
VOCs in Ambient Air by GC/MS							
1.1-Dichloroethane	Total ug	< 0.5			0.5	Pass	
1.1-Dichloroethene	Total ug	< 0.5			0.5	Pass	
1.1-Dichloropropene	Total ug	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	Total ug	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	Total ug	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	Total ug	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	Total ug	< 0.5			0.5	Pass	
1.2-Dibromo-3-chloropropane	Total ug	< 0.5			0.5	Pass	
1.2-Dibromoethane	Total ug	< 0.5			0.5	Pass	
1.2-Dichloroethane	Total ug	< 0.5			0.5	Pass	
1.2-Dichloropropane	Total ug	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	Total ug	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	Total ug	< 0.5			0.5	Pass	
1.3-Dichloropropane	Total ug	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	Total ug	< 0.5			0.5	Pass	
2-Chlorotoluene	Total ug	< 0.5			0.5	Pass	
2.2-Dichloropropane	Total ug	< 0.5			0.5	Pass	
4-Chlorotoluene	Total ug	< 0.5			0.5	Pass	
Benzene	Total ug	< 0.5			0.5	Pass	
Bromochloromethane	Total ug	< 0.5			0.5	Pass	
Bromodichloromethane	Total ug	< 0.5			0.5	Pass	
Bromoform	Total ug	< 0.5			0.5	Pass	
Carbon Tetrachloride	Total ug	< 0.5			0.5	Pass	
Chlorobenzene	Total ug	< 0.5			0.5	Pass	
Chloroform	Total ug	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	Total ug	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	Total ug	< 0.5			0.5	Pass	
Dibromochloromethane	Total ug	< 0.5			0.5	Pass	
Dibromomethane	Total ug	< 0.5			0.5	Pass	
Ethylbenzene	Total ug	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	Total ug	< 0.5			0.5	Pass	
n-Butylbenzene	Total ug	< 0.5			0.5	Pass	
n-Propylbenzene	Total ug	< 0.5			0.5	Pass	
Naphthalene	Total ug	< 0.5			0.5	Pass	
p-Isopropyltoluene	Total ug	< 0.5			0.5	Pass	
sec-Butylbenzene	Total ug	< 0.5			0.5	Pass	
Styrene	Total ug	< 5			5	Pass	
tert-Butylbenzene	Total ug	< 0.5			0.5	Pass	
Tetrachloroethene	Total ug	< 0.5			0.5	Pass	
Toluene	Total ug	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	Total ug	< 0.5			0.5	Pass	
Trichloroethene	Total ug	< 0.5			0.5	Pass	
Trichlorofluoromethane	Total ug	< 0.5			0.5	Pass	
Vinyl chloride	Total ug	< 0.5			0.5	Pass	
Xylenes - Total*	Total ug	< 1.5			1.5	Pass	
1.2-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.2.3-Trichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.2.4-Trichlorobenzene	Total ug	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
1.3-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	Total ug	< 0.5			0.5	Pass	
Hexachlorobutadiene	Total ug	< 0.5			0.5	Pass	
LCS - % Recovery							
Isopropanol	%	97			70-130	Pass	
LCS - % Recovery							
VOCs in Ambient Air by GC/MS							
1.1-Dichloroethene	%	102			70-130	Pass	
1.1-Dichloropropene	%	100			70-130	Pass	
1.1.1-Trichloroethane	%	103			70-130	Pass	
1.2-Dibromo-3-chloropropane	%	97			75-125	Pass	
1.2-Dichloroethane	%	105			70-130	Pass	
Benzene	%	95			70-130	Pass	
Ethylbenzene	%	112			70-130	Pass	
Naphthalene	%	70			70-130	Pass	
Toluene	%	112			70-130	Pass	
Trichloroethene	%	95			70-130	Pass	
Xylenes - Total*	%	82			70-130	Pass	
1.2-Dichlorobenzene	%	80			70-130	Pass	
1.2.3-Trichlorobenzene	%	81			70-130	Pass	
1.2.4-Trichlorobenzene	%	74			70-130	Pass	
1.4-Dichlorobenzene	%	81			70-130	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Ursula Long	Analytical Services Manager
Harry Bacalis	Senior Analyst-Volatile (VIC)
Joseph Edouard	Senior Analyst-Organic (VIC)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Sample Receipt Advice

Company name:	**JBS & G Australia (NSW) P/L**
Contact name:	Chris Bielby
Project name:	PENRITH SOIL VAPOUR
Project ID:	58140
COC number:	Not provided
Turn around time:	2 Day
Date/Time received:	Jun 1, 2020 4:58 PM
Eurofins reference:	**722975**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Ursula Long on Phone : or by e.mail: UrsulaLong@eurofins.com

Results will be delivered electronically via e.mail to Chris Bielby - cbielby@jbsg.com.au.

Chain of Custody

Eurofins 1 of 1

JBS&G

PROJECT NO.: 58140
PROJECT NAME: Penrith Soil Vapour
DATE NEEDED BY: 48hrs
LABORATORY BATCH NO.: 722975
SAMPLERS: MN
QC LEVEL: NEPM (2013)
PHONE: Sydney 02 8245 0300 | Perth 08 9488 0100 | Brisbane 07 3112 2688 | Melbourne 03 9642 0599 | Adelaide 08 8431 7113
SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) .....@jbsg.com.au; (3) .....@jbsg.com.au
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	VOCs 8260	Modified	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
SV10-A	Air	30/5		Carbon tube		X	X			
10-B										
11-A										
11-B										
12		29/5								
13										
14										
15										
16										
17										
19										
~~18~~										
FB										

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: [signature] DATE: 01/06/20	CONSIGNMENT NOTE NO.	NAME: [signature]	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 1/6/2020 4:58pm	
NAME: DATE:	CONSIGNMENT NOTE NO.	OF: Eurofins	COOLER TEMP ..... deg C
OF:	TRANSPORT CO	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
		OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS & G Australia (NSW) P/L
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Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Chris Bielby**

Report **723042-S**
Project name PENRITH SOIL
Project ID 58140
Received Date Jun 01, 2020

Client Sample ID			**SV10 0.1-0.2**	**SV10 1.3-1.4**	**SV10 2.3-2.4**	**SV10 4.0-4.1**
Sample Matrix			**Soil**	**Soil**	**Soil**	**Soil**
Eurofins Sample No.			**S20-Jn02053**	**S20-Jn02054**	**S20-Jn02055**	**S20-Jn02056**
Date Sampled			**May 29, 2020**	**May 29, 2020**	**May 29, 2020**	**May 29, 2020**
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	64	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	64	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	89	89	61	81
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dibromoethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Butanone (MEK)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Allyl chloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV10 0.1-0.2	SV10 1.3-1.4	SV10 2.3-2.4	SV10 4.0-4.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Jn02053	S20-Jn02054	S20-Jn02055	S20-Jn02056
Date Sampled			May 29, 2020	May 29, 2020	May 29, 2020	May 29, 2020
Test/Reference	LOR	Unit				
Volatile Organics						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Bromobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Bromomethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Carbon disulfide	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Iodomethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Styrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
Total MAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Bromofluorobenzene (surr.)	1	%	89	89	86	81
Toluene-d8 (surr.)	1	%	99	107	99	90
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100

Client Sample ID			SV10 0.1-0.2	SV10 1.3-1.4	SV10 2.3-2.4	SV10 4.0-4.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Jn02053	S20-Jn02054	S20-Jn02055	S20-Jn02056
Date Sampled			May 29, 2020	May 29, 2020	May 29, 2020	May 29, 2020
Test/Reference	LOR	Unit				
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	3.2	-	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	3.5	-	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	3.7	-	-	-
Acenaphthene	0.5	mg/kg	< 0.5	-	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	-	-
Anthracene	0.5	mg/kg	< 0.5	-	-	-
Benz(a)anthracene	0.5	mg/kg	1.8	-	-	-
Benzo(a)pyrene	0.5	mg/kg	2.5	-	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	1.8	-	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	1.3	-	-	-
Benzo(k)fluoranthene	0.5	mg/kg	2.0	-	-	-
Chrysene	0.5	mg/kg	1.9	-	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-	-
Fluoranthene	0.5	mg/kg	6.2	-	-	-
Fluorene	0.5	mg/kg	< 0.5	-	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	1.3	-	-	-
Naphthalene	0.5	mg/kg	< 0.5	-	-	-
Phenanthrene	0.5	mg/kg	3.1	-	-	-
Pyrene	0.5	mg/kg	6.1	-	-	-
Total PAH*	0.5	mg/kg	28	-	-	-
2-Fluorobiphenyl (surr.)	1	%	111	-	-	-
p-Terphenyl-d14 (surr.)	1	%	122	-	-	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Dibutylchlorendate (surr.)	1	%	121	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	106	-	-	-

Client Sample ID			SV10 0.1-0.2	SV10 1.3-1.4	SV10 2.3-2.4	SV10 4.0-4.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Jn02053	S20-Jn02054	S20-Jn02055	S20-Jn02056
Date Sampled			May 29, 2020	May 29, 2020	May 29, 2020	May 29, 2020
Test/Reference	LOR	Unit				
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	-
Total PCB*	0.5	mg/kg	< 0.5	-	-	-
Dibutylchlorendate (surr.)	1	%	121	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	106	-	-	-
Heavy Metals						
Arsenic	2	mg/kg	11	-	-	-
Cadmium	0.4	mg/kg	< 0.4	-	-	-
Chromium	5	mg/kg	17	-	-	-
Copper	5	mg/kg	37	-	-	-
Lead	5	mg/kg	87	-	-	-
Mercury	0.1	mg/kg	0.2	-	-	-
Nickel	5	mg/kg	18	-	-	-
Zinc	5	mg/kg	110	-	-	-
% Moisture	1	%	19	22	21	11

Client Sample ID			SV11 0.2-0.3	SV11 1.0-1.1	SV11 2.0-2.1	SV11 3.0-3.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Jn02059	S20-Jn02060	S20-Jn02061	S20-Jn02062
Date Sampled			May 29, 2020	May 29, 2020	May 29, 2020	May 29, 2020
Test/Reference	LOR	Unit				
Total Recoverable Hydrocarbons - 1999 NEPM Fractions						
TRH C6-C9	20	mg/kg	< 20	< 20	< 20	< 20
TRH C10-C14	20	mg/kg	< 20	< 20	< 20	< 20
TRH C15-C28	50	mg/kg	< 50	< 50	< 50	< 50
TRH C29-C36	50	mg/kg	< 50	< 50	< 50	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50	< 50	< 50	< 50
BTEX						
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
4-Bromofluorobenzene (surr.)	1	%	96	92	86	77
Volatile Organics						
1.1-Dichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.1-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5

Client Sample ID			SV11 0.2-0.3	SV11 1.0-1.1	SV11 2.0-2.1	SV11 3.0-3.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Jn02059	S20-Jn02060	S20-Jn02061	S20-Jn02062
Date Sampled			May 29, 2020	May 29, 2020	May 29, 2020	May 29, 2020
Test/Reference	LOR	Unit				
Volatile Organics						
1.2-Dibromoethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2-Dichloropropane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.3-Dichloropropane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Butanone (MEK)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Chlorotoluene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Allyl chloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Bromobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Bromochloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Bromomethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Carbon disulfide	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Carbon Tetrachloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chlorobenzene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chloroethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chloroform	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Chloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibromochloromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dibromomethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Iodomethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
m&p-Xylenes	0.2	mg/kg	< 0.2	< 0.2	< 0.2	< 0.2
Methylene Chloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
o-Xylene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
Styrene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene	0.5	mg/kg	2.2	< 0.5	< 0.5	< 0.5
Toluene	0.1	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethene	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl chloride	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Xylenes - Total*	0.3	mg/kg	< 0.3	< 0.3	< 0.3	< 0.3
Total MAH*	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	2.2	< 0.5	< 0.5	< 0.5

Client Sample ID			SV11 0.2-0.3	SV11 1.0-1.1	SV11 2.0-2.1	SV11 3.0-3.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Jn02059	S20-Jn02060	S20-Jn02061	S20-Jn02062
Date Sampled			May 29, 2020	May 29, 2020	May 29, 2020	May 29, 2020
Test/Reference	LOR	Unit				
Volatile Organics						
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	2.2	< 0.5	< 0.5	< 0.5
4-Bromofluorobenzene (surr.)	1	%	96	92	86	77
Toluene-d8 (surr.)	1	%	106	104	105	90
Total Recoverable Hydrocarbons - 2013 NEPM Fractions						
Naphthalene[N02]	0.5	mg/kg	< 0.5	< 0.5	< 0.5	< 0.5
TRH C6-C10	20	mg/kg	< 20	< 20	< 20	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20	< 20	< 20	< 20
TRH >C10-C16	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50	< 50	< 50	< 50
TRH >C16-C34	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C34-C40	100	mg/kg	< 100	< 100	< 100	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100	< 100	< 100	< 100
Polycyclic Aromatic Hydrocarbons						
Benzo(a)pyrene TEQ (lower bound) *	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene TEQ (medium bound) *	0.5	mg/kg	0.6	-	-	-
Benzo(a)pyrene TEQ (upper bound) *	0.5	mg/kg	1.2	-	-	-
Acenaphthene	0.5	mg/kg	< 0.5	-	-	-
Acenaphthylene	0.5	mg/kg	< 0.5	-	-	-
Anthracene	0.5	mg/kg	< 0.5	-	-	-
Benz(a)anthracene	0.5	mg/kg	< 0.5	-	-	-
Benzo(a)pyrene	0.5	mg/kg	< 0.5	-	-	-
Benzo(b&j)fluoranthene[N07]	0.5	mg/kg	< 0.5	-	-	-
Benzo(g.h.i)perylene	0.5	mg/kg	< 0.5	-	-	-
Benzo(k)fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Chrysene	0.5	mg/kg	< 0.5	-	-	-
Dibenz(a.h)anthracene	0.5	mg/kg	< 0.5	-	-	-
Fluoranthene	0.5	mg/kg	< 0.5	-	-	-
Fluorene	0.5	mg/kg	< 0.5	-	-	-
Indeno(1.2.3-cd)pyrene	0.5	mg/kg	< 0.5	-	-	-
Naphthalene	0.5	mg/kg	< 0.5	-	-	-
Phenanthrene	0.5	mg/kg	< 0.5	-	-	-
Pyrene	0.5	mg/kg	< 0.5	-	-	-
Total PAH*	0.5	mg/kg	< 0.5	-	-	-
2-Fluorobiphenyl (surr.)	1	%	76	-	-	-
p-Terphenyl-d14 (surr.)	1	%	80	-	-	-
Organochlorine Pesticides						
Chlordanes - Total	0.1	mg/kg	< 0.1	-	-	-
4.4'-DDD	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDE	0.05	mg/kg	< 0.05	-	-	-
4.4'-DDT	0.05	mg/kg	< 0.05	-	-	-
a-BHC	0.05	mg/kg	< 0.05	-	-	-
Aldrin	0.05	mg/kg	< 0.05	-	-	-
b-BHC	0.05	mg/kg	< 0.05	-	-	-
d-BHC	0.05	mg/kg	< 0.05	-	-	-
Dieldrin	0.05	mg/kg	< 0.05	-	-	-
Endosulfan I	0.05	mg/kg	< 0.05	-	-	-
Endosulfan II	0.05	mg/kg	< 0.05	-	-	-
Endosulfan sulphate	0.05	mg/kg	< 0.05	-	-	-
Endrin	0.05	mg/kg	< 0.05	-	-	-

Client Sample ID			SV11 0.2-0.3	SV11 1.0-1.1	SV11 2.0-2.1	SV11 3.0-3.1
Sample Matrix			Soil	Soil	Soil	Soil
Eurofins Sample No.			S20-Jn02059	S20-Jn02060	S20-Jn02061	S20-Jn02062
Date Sampled			May 29, 2020	May 29, 2020	May 29, 2020	May 29, 2020
Test/Reference	LOR	Unit				
Organochlorine Pesticides						
Endrin aldehyde	0.05	mg/kg	< 0.05	-	-	-
Endrin ketone	0.05	mg/kg	< 0.05	-	-	-
g-BHC (Lindane)	0.05	mg/kg	< 0.05	-	-	-
Heptachlor	0.05	mg/kg	< 0.05	-	-	-
Heptachlor epoxide	0.05	mg/kg	< 0.05	-	-	-
Hexachlorobenzene	0.05	mg/kg	< 0.05	-	-	-
Methoxychlor	0.2	mg/kg	< 0.2	-	-	-
Toxaphene	1	mg/kg	< 1	-	-	-
Aldrin and Dieldrin (Total)*	0.05	mg/kg	< 0.05	-	-	-
DDT + DDE + DDD (Total)*	0.05	mg/kg	< 0.05	-	-	-
Vic EPA IWRG 621 OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Vic EPA IWRG 621 Other OCP (Total)*	0.1	mg/kg	< 0.2	-	-	-
Dibutylchlorendate (surr.)	1	%	67	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	82	-	-	-
Polychlorinated Biphenyls						
Aroclor-1016	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1221	0.1	mg/kg	< 0.1	-	-	-
Aroclor-1232	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1242	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1248	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1254	0.5	mg/kg	< 0.5	-	-	-
Aroclor-1260	0.5	mg/kg	< 0.5	-	-	-
Total PCB*	0.5	mg/kg	< 0.5	-	-	-
Dibutylchlorendate (surr.)	1	%	67	-	-	-
Tetrachloro-m-xylene (surr.)	1	%	82	-	-	-
Heavy Metals						
Arsenic	2	mg/kg	4.8	-	-	-
Cadmium	0.4	mg/kg	< 0.4	-	-	-
Chromium	5	mg/kg	26	-	-	-
Copper	5	mg/kg	13	-	-	-
Lead	5	mg/kg	19	-	-	-
Mercury	0.1	mg/kg	< 0.1	-	-	-
Nickel	5	mg/kg	9.8	-	-	-
Zinc	5	mg/kg	45	-	-	-
% Moisture	1	%	6.6	22	23	22

Client Sample ID			SV11 4.0-4.1
Sample Matrix			Soil
Eurofins Sample No.			S20-Jn02063
Date Sampled			May 29, 2020
Test/Reference	LOR	Unit	
Total Recoverable Hydrocarbons - 1999 NEPM Fractions			
TRH C6-C9	20	mg/kg	< 20
TRH C10-C14	20	mg/kg	< 20
TRH C15-C28	50	mg/kg	< 50
TRH C29-C36	50	mg/kg	< 50
TRH C10-C36 (Total)	50	mg/kg	< 50

Client Sample ID			SV11 4.0-4.1
Sample Matrix			Soil
Eurofins Sample No.			S20-Jn02063
Date Sampled			May 29, 2020
Test/Reference	LOR	Unit	
BTEX			
Benzene	0.1	mg/kg	< 0.1
Toluene	0.1	mg/kg	< 0.1
Ethylbenzene	0.1	mg/kg	< 0.1
m&p-Xylenes	0.2	mg/kg	< 0.2
o-Xylene	0.1	mg/kg	< 0.1
Xylenes - Total*	0.3	mg/kg	< 0.3
4-Bromofluorobenzene (surr.)	1	%	80
Volatile Organics			
1.1-Dichloroethane	0.5	mg/kg	< 0.5
1.1-Dichloroethene	0.5	mg/kg	< 0.5
1.1.1-Trichloroethane	0.5	mg/kg	< 0.5
1.1.1.2-Tetrachloroethane	0.5	mg/kg	< 0.5
1.1.2-Trichloroethane	0.5	mg/kg	< 0.5
1.1.2.2-Tetrachloroethane	0.5	mg/kg	< 0.5
1.2-Dibromoethane	0.5	mg/kg	< 0.5
1.2-Dichlorobenzene	0.5	mg/kg	< 0.5
1.2-Dichloroethane	0.5	mg/kg	< 0.5
1.2-Dichloropropane	0.5	mg/kg	< 0.5
1.2.3-Trichloropropane	0.5	mg/kg	< 0.5
1.2.4-Trimethylbenzene	0.5	mg/kg	< 0.5
1.3-Dichlorobenzene	0.5	mg/kg	< 0.5
1.3-Dichloropropane	0.5	mg/kg	< 0.5
1.3.5-Trimethylbenzene	0.5	mg/kg	< 0.5
1.4-Dichlorobenzene	0.5	mg/kg	< 0.5
2-Butanone (MEK)	0.5	mg/kg	< 0.5
2-Propanone (Acetone)	0.5	mg/kg	< 0.5
4-Chlorotoluene	0.5	mg/kg	< 0.5
4-Methyl-2-pentanone (MIBK)	0.5	mg/kg	< 0.5
Allyl chloride	0.5	mg/kg	< 0.5
Benzene	0.1	mg/kg	< 0.1
Bromobenzene	0.5	mg/kg	< 0.5
Bromochloromethane	0.5	mg/kg	< 0.5
Bromodichloromethane	0.5	mg/kg	< 0.5
Bromoform	0.5	mg/kg	< 0.5
Bromomethane	0.5	mg/kg	< 0.5
Carbon disulfide	0.5	mg/kg	< 0.5
Carbon Tetrachloride	0.5	mg/kg	< 0.5
Chlorobenzene	0.5	mg/kg	< 0.5
Chloroethane	0.5	mg/kg	< 0.5
Chloroform	0.5	mg/kg	< 0.5
Chloromethane	0.5	mg/kg	< 0.5
cis-1.2-Dichloroethene	0.5	mg/kg	< 0.5
cis-1.3-Dichloropropene	0.5	mg/kg	< 0.5
Dibromochloromethane	0.5	mg/kg	< 0.5
Dibromomethane	0.5	mg/kg	< 0.5
Dichlorodifluoromethane	0.5	mg/kg	< 0.5
Ethylbenzene	0.1	mg/kg	< 0.1
Iodomethane	0.5	mg/kg	< 0.5
Isopropyl benzene (Cumene)	0.5	mg/kg	< 0.5

Client Sample ID			SV11 4.0-4.1
Sample Matrix			**Soil**
Eurofins Sample No.			**S20-Jn02063**
Date Sampled			**May 29, 2020**
Test/Reference	LOR	Unit	
Volatile Organics			
m&p-Xylenes	0.2	mg/kg	< 0.2
Methylene Chloride	0.5	mg/kg	< 0.5
o-Xylene	0.1	mg/kg	< 0.1
Styrene	0.5	mg/kg	< 0.5
Tetrachloroethene	0.5	mg/kg	0.9
Toluene	0.1	mg/kg	< 0.1
trans-1.2-Dichloroethene	0.5	mg/kg	< 0.5
trans-1.3-Dichloropropene	0.5	mg/kg	< 0.5
Trichloroethene	0.5	mg/kg	< 0.5
Trichlorofluoromethane	0.5	mg/kg	< 0.5
Vinyl chloride	0.5	mg/kg	< 0.5
Xylenes - Total*	0.3	mg/kg	< 0.3
Total MAH*	0.5	mg/kg	< 0.5
Vic EPA IWRG 621 CHC (Total)*	0.5	mg/kg	0.9
Vic EPA IWRG 621 Other CHC (Total)*	0.5	mg/kg	0.9
4-Bromofluorobenzene (surr.)	1	%	80
Toluene-d8 (surr.)	1	%	93
Total Recoverable Hydrocarbons - 2013 NEPM Fractions			
Naphthalene[N02]	0.5	mg/kg	< 0.5
TRH C6-C10	20	mg/kg	< 20
TRH C6-C10 less BTEX (F1)[N04]	20	mg/kg	< 20
TRH >C10-C16	50	mg/kg	< 50
TRH >C10-C16 less Naphthalene (F2)[N01]	50	mg/kg	< 50
TRH >C16-C34	100	mg/kg	< 100
TRH >C34-C40	100	mg/kg	< 100
TRH >C10-C40 (total)*	100	mg/kg	< 100
% Moisture	1	%	15

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B1			
Total Recoverable Hydrocarbons - 1999 NEPM Fractions	Sydney	Jun 02, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
BTEX	Sydney	Jun 02, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 02, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			
Total Recoverable Hydrocarbons - 2013 NEPM Fractions	Sydney	Jun 02, 2020	
- Method: LTM-ORG-2010 TRH C6-C40			
Volatile Organics	Sydney	Jun 04, 2020	7 Days
- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices			
Polycyclic Aromatic Hydrocarbons	Sydney	Jun 02, 2020	14 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Jun 02, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
Organochlorine Pesticides	Sydney	Jun 02, 2020	14 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
Polychlorinated Biphenyls	Sydney	Jun 02, 2020	28 Days
- Method: LTM-ORG-2220 OCP & PCB in Soil and Water			
% Moisture	Sydney	Jun 01, 2020	14 Days
- Method: LTM-GEN-7080 Moisture			

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Project Name: PENRITH SOIL
Project ID: 58140

Order No.:
Report #: 723042
Phone: 02 8245 0300
Fax:

Received: Jun 1, 2020 4:48 PM
Due: Jun 3, 2020
Priority: 2 Day
Contact Name: Chris Bielby

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Suite B13: OCP/PCB	AUS Leaching Procedure - ZHE	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271														
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	SV10 0.1-0.2	May 29, 2020		Soil	S20-Jn02053	X			X		X	X	X	
2	SV10 1.3-1.4	May 29, 2020		Soil	S20-Jn02054						X	X		X
3	SV10 2.3-2.4	May 29, 2020		Soil	S20-Jn02055						X	X		X
4	SV10 4.0-4.1	May 29, 2020		Soil	S20-Jn02056						X	X		X
5	TS	May 29, 2020		Water	S20-Jn02057			X						
6	TB	May 29, 2020		Water	S20-Jn02058			X						
7	SV11 0.2-0.3	May 29, 2020		Soil	S20-Jn02059	X			X		X	X	X	
8	SV11 1.0-1.1	May 29, 2020		Soil	S20-Jn02060						X	X		X
9	SV11 2.0-2.1	May 29, 2020		Soil	S20-Jn02061						X	X		X
10	SV11 3.0-3.1	May 29, 2020		Soil	S20-Jn02062						X	X		X

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

eurofins | Environment Testing

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH SOIL
Project ID: 58140

Order No.:
Report #: 723042
Phone: 02 8245 0300
Fax:

Received: Jun 1, 2020 4:48 PM
Due: Jun 3, 2020
Priority: 2 Day
Contact Name: Chris Bielby

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Suite B13: OCP/PCB	AUS Leaching Procedure - ZHE	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271														
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
11	SV11 4.0-4.1	May 29, 2020		Soil	S20-Jn02063						X	X		X
12	SV10 0.1-0.2	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02064					X	X			
13	SV10 1.3-1.4	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02065					X	X			
14	SV10 2.3-2.4	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02066					X	X			
15	SV10 4.0-4.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02067					X	X			
16	SV11 0.2-0.3	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02068					X	X			

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Project Name: PENRITH SOIL
Project ID: 58140

Order No.:
Report #: 723042
Phone: 02 8245 0300
Fax:

Received: Jun 1, 2020 4:48 PM
Due: Jun 3, 2020
Priority: 2 Day
Contact Name: Chris Bielby

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Suite B13: OCP/PCB	AUS Leaching Procedure - ZHE	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271														
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
17	SV11 1.0-1.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02069					X	X			
18	SV11 2.0-2.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02070					X	X			
19	SV11 3.0-3.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02071					X	X			
20	SV11 4.0-4.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02072					X	X			
21	SV10 0.5-0.6	May 29, 2020		Soil	S20-Jn02073		X							
22	SV10 3.4-3.5	May 29, 2020		Soil	S20-Jn02074		X							
23	SV11 0-0.1	May 29, 2020		Soil	S20-Jn02075		X							

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Melbourne Laboratory - NATA Site # 1254 & 14271														
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
24	SV11 0.5-0.6	May 29, 2020		Soil	S20-Jn02076		X							
25	SV11 2.5-2.6	May 29, 2020		Soil	S20-Jn02077		X							
26	SV11 3.5-3.6	May 29, 2020		Soil	S20-Jn02078		X							
27	QC01	May 29, 2020		Soil	S20-Jn02079		X							
28	QA01	May 29, 2020		Soil	S20-Jn02080		X							
Test Counts						2	8	2	2	9	18	9	2	7

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram
mg/L: milligrams per litre
ug/L: micrograms per litre
ppm: Parts per million
ppb: Parts per billion
%: Percentage
org/100mL: Organisms per 100 millilitres
NTU: Nephelometric Turbidity Units
MPN/100mL: Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	mg/kg	< 20			20	Pass	
TRH C10-C14	mg/kg	< 20			20	Pass	
TRH C15-C28	mg/kg	< 50			50	Pass	
TRH C29-C36	mg/kg	< 50			50	Pass	
Method Blank							
BTEX							
Benzene	mg/kg	< 0.1			0.1	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
1.1.1-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.1.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2-Trichloroethane	mg/kg	< 0.5			0.5	Pass	
1.1.2.2-Tetrachloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dibromoethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloroethane	mg/kg	< 0.5			0.5	Pass	
1.2-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.3-Trichloropropane	mg/kg	< 0.5			0.5	Pass	
1.2.4-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
1.3-Dichloropropane	mg/kg	< 0.5			0.5	Pass	
1.3.5-Trimethylbenzene	mg/kg	< 0.5			0.5	Pass	
1.4-Dichlorobenzene	mg/kg	< 0.5			0.5	Pass	
2-Butanone (MEK)	mg/kg	< 0.5			0.5	Pass	
2-Propanone (Acetone)	mg/kg	< 0.5			0.5	Pass	
4-Chlorotoluene	mg/kg	< 0.5			0.5	Pass	
4-Methyl-2-pentanone (MIBK)	mg/kg	< 0.5			0.5	Pass	
Allyl chloride	mg/kg	< 0.5			0.5	Pass	
Benzene	mg/kg	< 0.1			0.1	Pass	
Bromobenzene	mg/kg	< 0.5			0.5	Pass	
Bromochloromethane	mg/kg	< 0.5			0.5	Pass	
Bromodichloromethane	mg/kg	< 0.5			0.5	Pass	
Bromoform	mg/kg	< 0.5			0.5	Pass	
Bromomethane	mg/kg	< 0.5			0.5	Pass	
Carbon disulfide	mg/kg	< 0.5			0.5	Pass	
Carbon Tetrachloride	mg/kg	< 0.5			0.5	Pass	
Chlorobenzene	mg/kg	< 0.5			0.5	Pass	
Chloroethane	mg/kg	< 0.5			0.5	Pass	
Chloroform	mg/kg	< 0.5			0.5	Pass	
Chloromethane	mg/kg	< 0.5			0.5	Pass	
cis-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
cis-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Dibromochloromethane	mg/kg	< 0.5			0.5	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Dibromomethane	mg/kg	< 0.5			0.5	Pass	
Dichlorodifluoromethane	mg/kg	< 0.5			0.5	Pass	
Ethylbenzene	mg/kg	< 0.1			0.1	Pass	
Iodomethane	mg/kg	< 0.5			0.5	Pass	
Isopropyl benzene (Cumene)	mg/kg	< 0.5			0.5	Pass	
m&p-Xylenes	mg/kg	< 0.2			0.2	Pass	
Methylene Chloride	mg/kg	< 0.5			0.5	Pass	
o-Xylene	mg/kg	< 0.1			0.1	Pass	
Styrene	mg/kg	< 0.5			0.5	Pass	
Tetrachloroethene	mg/kg	< 0.5			0.5	Pass	
Toluene	mg/kg	< 0.1			0.1	Pass	
trans-1.2-Dichloroethene	mg/kg	< 0.5			0.5	Pass	
trans-1.3-Dichloropropene	mg/kg	< 0.5			0.5	Pass	
Trichloroethene	mg/kg	< 0.5			0.5	Pass	
Trichlorofluoromethane	mg/kg	< 0.5			0.5	Pass	
Vinyl chloride	mg/kg	< 0.5			0.5	Pass	
Xylenes - Total*	mg/kg	< 0.3			0.3	Pass	
Method Blank							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	mg/kg	< 0.5			0.5	Pass	
TRH C6-C10	mg/kg	< 20			20	Pass	
TRH >C10-C16	mg/kg	< 50			50	Pass	
TRH >C16-C34	mg/kg	< 100			100	Pass	
TRH >C34-C40	mg/kg	< 100			100	Pass	
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/kg	< 0.5			0.5	Pass	
Acenaphthylene	mg/kg	< 0.5			0.5	Pass	
Anthracene	mg/kg	< 0.5			0.5	Pass	
Benz(a)anthracene	mg/kg	< 0.5			0.5	Pass	
Benzo(a)pyrene	mg/kg	< 0.5			0.5	Pass	
Benzo(b&j)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Benzo(g.h.i)perylene	mg/kg	< 0.5			0.5	Pass	
Benzo(k)fluoranthene	mg/kg	< 0.5			0.5	Pass	
Chrysene	mg/kg	< 0.5			0.5	Pass	
Dibenz(a.h)anthracene	mg/kg	< 0.5			0.5	Pass	
Fluoranthene	mg/kg	< 0.5			0.5	Pass	
Fluorene	mg/kg	< 0.5			0.5	Pass	
Indeno(1.2.3-cd)pyrene	mg/kg	< 0.5			0.5	Pass	
Naphthalene	mg/kg	< 0.5			0.5	Pass	
Phenanthrene	mg/kg	< 0.5			0.5	Pass	
Pyrene	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Organochlorine Pesticides							
Chlordanes - Total	mg/kg	< 0.1			0.1	Pass	
4.4'-DDD	mg/kg	< 0.05			0.05	Pass	
4.4'-DDE	mg/kg	< 0.05			0.05	Pass	
4.4'-DDT	mg/kg	< 0.05			0.05	Pass	
a-BHC	mg/kg	< 0.05			0.05	Pass	
Aldrin	mg/kg	< 0.05			0.05	Pass	
b-BHC	mg/kg	< 0.05			0.05	Pass	
d-BHC	mg/kg	< 0.05			0.05	Pass	
Dieldrin	mg/kg	< 0.05			0.05	Pass	
Endosulfan I	mg/kg	< 0.05			0.05	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Endosulfan II	mg/kg	< 0.05			0.05	Pass	
Endosulfan sulphate	mg/kg	< 0.05			0.05	Pass	
Endrin	mg/kg	< 0.05			0.05	Pass	
Endrin aldehyde	mg/kg	< 0.05			0.05	Pass	
Endrin ketone	mg/kg	< 0.05			0.05	Pass	
g-BHC (Lindane)	mg/kg	< 0.05			0.05	Pass	
Heptachlor	mg/kg	< 0.05			0.05	Pass	
Heptachlor epoxide	mg/kg	< 0.05			0.05	Pass	
Hexachlorobenzene	mg/kg	< 0.05			0.05	Pass	
Methoxychlor	mg/kg	< 0.2			0.2	Pass	
Toxaphene	mg/kg	< 1			1	Pass	
Method Blank							
Polychlorinated Biphenyls							
Aroclor-1016	mg/kg	< 0.5			0.5	Pass	
Aroclor-1221	mg/kg	< 0.1			0.1	Pass	
Aroclor-1232	mg/kg	< 0.5			0.5	Pass	
Aroclor-1242	mg/kg	< 0.5			0.5	Pass	
Aroclor-1248	mg/kg	< 0.5			0.5	Pass	
Aroclor-1254	mg/kg	< 0.5			0.5	Pass	
Aroclor-1260	mg/kg	< 0.5			0.5	Pass	
Total PCB*	mg/kg	< 0.5			0.5	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/kg	< 2			2	Pass	
Cadmium	mg/kg	< 0.4			0.4	Pass	
Chromium	mg/kg	< 5			5	Pass	
Copper	mg/kg	< 5			5	Pass	
Lead	mg/kg	< 5			5	Pass	
Mercury	mg/kg	< 0.1			0.1	Pass	
Nickel	mg/kg	< 5			5	Pass	
Zinc	mg/kg	< 5			5	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 1999 NEPM Fractions							
TRH C6-C9	%	108			70-130	Pass	
TRH C10-C14	%	92			70-130	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	106			70-130	Pass	
Toluene	%	113			70-130	Pass	
Ethylbenzene	%	111			70-130	Pass	
m&p-Xylenes	%	121			70-130	Pass	
o-Xylene	%	113			70-130	Pass	
Xylenes - Total*	%	118			70-130	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	115			70-130	Pass	
1.1.1-Trichloroethane	%	99			70-130	Pass	
1.2-Dichlorobenzene	%	108			70-130	Pass	
1.2-Dichloroethane	%	107			70-130	Pass	
Benzene	%	106			70-130	Pass	
Ethylbenzene	%	111			70-130	Pass	
m&p-Xylenes	%	117			70-130	Pass	
o-Xylene	%	108			70-130	Pass	
Trichloroethene	%	115			70-130	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Xylenes - Total*	%	114			70-130	Pass	
LCS - % Recovery							
Total Recoverable Hydrocarbons - 2013 NEPM Fractions							
Naphthalene	%	83			70-130	Pass	
TRH C6-C10	%	109			70-130	Pass	
TRH >C10-C16	%	93			70-130	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	127			70-130	Pass	
Acenaphthylene	%	116			70-130	Pass	
Anthracene	%	105			70-130	Pass	
Benz(a)anthracene	%	129			70-130	Pass	
Benzo(b&j)fluoranthene	%	128			70-130	Pass	
Benzo(g.h.i)perylene	%	128			70-130	Pass	
Dibenz(a.h)anthracene	%	130			70-130	Pass	
Fluoranthene	%	129			70-130	Pass	
Fluorene	%	126			70-130	Pass	
Naphthalene	%	119			70-130	Pass	
Phenanthrene	%	127			70-130	Pass	
Pyrene	%	129			70-130	Pass	
LCS - % Recovery							
Organochlorine Pesticides							
Chlordanes - Total	%	89			70-130	Pass	
4.4'-DDD	%	85			70-130	Pass	
4.4'-DDE	%	87			70-130	Pass	
4.4'-DDT	%	80			70-130	Pass	
a-BHC	%	83			70-130	Pass	
Aldrin	%	87			70-130	Pass	
b-BHC	%	84			70-130	Pass	
d-BHC	%	91			70-130	Pass	
Dieldrin	%	92			70-130	Pass	
Endosulfan I	%	100			70-130	Pass	
Endosulfan II	%	88			70-130	Pass	
Endosulfan sulphate	%	79			70-130	Pass	
Endrin	%	85			70-130	Pass	
Endrin aldehyde	%	86			70-130	Pass	
Endrin ketone	%	92			70-130	Pass	
g-BHC (Lindane)	%	85			70-130	Pass	
Heptachlor	%	82			70-130	Pass	
Heptachlor epoxide	%	73			70-130	Pass	
Hexachlorobenzene	%	92			70-130	Pass	
LCS - % Recovery							
Polychlorinated Biphenyls							
Aroclor-1016	%	115			70-130	Pass	
Aroclor-1260	%	112			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	111			70-130	Pass	
Cadmium	%	104			70-130	Pass	
Chromium	%	111			70-130	Pass	
Copper	%	110			70-130	Pass	
Lead	%	110			70-130	Pass	
Mercury	%	104			70-130	Pass	
Nickel	%	110			70-130	Pass	
Zinc	%	106			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1					
TRH C6-C9	S20-Jn02054	CP	%	101			70-130	Pass	
TRH C10-C14	S20-Jn02054	CP	%	83			70-130	Pass	
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-Jn02054	CP	%	107			70-130	Pass	
Toluene	S20-Jn02054	CP	%	106			70-130	Pass	
Ethylbenzene	S20-Jn02054	CP	%	111			70-130	Pass	
m&p-Xylenes	S20-Jn02054	CP	%	121			70-130	Pass	
o-Xylene	S20-Jn02054	CP	%	120			70-130	Pass	
Xylenes - Total*	S20-Jn02054	CP	%	120			70-130	Pass	
Spike - % Recovery									
Volatile Organics				Result 1					
1.1-Dichloroethene	S20-Jn02054	CP	%	116			70-130	Pass	
1.1.1-Trichloroethane	S20-Jn02054	CP	%	100			70-130	Pass	
1.2-Dichlorobenzene	S20-Jn02054	CP	%	107			70-130	Pass	
1.2-Dichloroethane	S20-Jn02054	CP	%	101			70-130	Pass	
Trichloroethene	S20-Jn02054	CP	%	112			70-130	Pass	
Spike - % Recovery									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1					
Naphthalene	S20-Jn02054	CP	%	74			70-130	Pass	
TRH C6-C10	S20-Jn02054	CP	%	103			70-130	Pass	
TRH >C10-C16	S20-Jn02054	CP	%	83			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-Jn02059	CP	%	116			70-130	Pass	
Cadmium	S20-Jn02059	CP	%	112			70-130	Pass	
Chromium	S20-Jn02059	CP	%	110			70-130	Pass	
Copper	S20-Jn02059	CP	%	109			70-130	Pass	
Lead	S20-Jn02059	CP	%	108			70-130	Pass	
Mercury	S20-Jn02059	CP	%	106			70-130	Pass	
Nickel	S20-Jn02059	CP	%	105			70-130	Pass	
Zinc	S20-Jn02059	CP	%	83			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Total Recoverable Hydrocarbons - 1999 NEPM Fractions				Result 1	Result 2	RPD			
TRH C6-C9	S20-Jn02053	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C10-C14	S20-Jn02053	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH C15-C28	S20-Jn02053	CP	mg/kg	64	< 50	86	30%	Fail	Q15
TRH C29-C36	S20-Jn02053	CP	mg/kg	< 50	< 50	<1	30%	Pass	
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-Jn02053	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Toluene	S20-Jn02053	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Ethylbenzene	S20-Jn02053	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
m&p-Xylenes	S20-Jn02053	CP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
o-Xylene	S20-Jn02053	CP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Xylenes - Total*	S20-Jn02053	CP	mg/kg	< 0.3	< 0.3	<1	30%	Pass	

Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1-Dichloroethene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1-Trichloroethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2-Trichloroethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dibromoethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichlorobenzene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloroethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2-Dichloropropane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.3-Trichloropropane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.2.4-Trimethylbenzene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichlorobenzene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3-Dichloropropane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.3.5-Trimethylbenzene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
1.4-Dichlorobenzene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Butanone (MEK)	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
2-Propanone (Acetone)	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Chlorotoluene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Allyl chloride	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromobenzene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromochloromethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromodichloromethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromoform	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Bromomethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon disulfide	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Carbon Tetrachloride	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chlorobenzene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloroform	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chloromethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.2-Dichloroethene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
cis-1.3-Dichloropropene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromochloromethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibromomethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dichlorodifluoromethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Iodomethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Isopropyl benzene (Cumene)	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Methylene Chloride	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Styrene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Tetrachloroethene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.2-Dichloroethene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
trans-1.3-Dichloropropene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichloroethene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Trichlorofluoromethane	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Vinyl chloride	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Total Recoverable Hydrocarbons - 2013 NEPM Fractions				Result 1	Result 2	RPD			
Naphthalene	S20-Jn02053	CP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
TRH C6-C10	S20-Jn02053	CP	mg/kg	< 20	< 20	<1	30%	Pass	
TRH >C10-C16	S20-Jn02053	CP	mg/kg	< 50	< 50	<1	30%	Pass	
TRH >C16-C34	S20-Jn02053	CP	mg/kg	< 100	< 100	<1	30%	Pass	
TRH >C34-C40	S20-Jn02053	CP	mg/kg	< 100	< 100	<1	30%	Pass	

Duplicate									
Polycyclic Aromatic Hydrocarbons				Result 1	Result 2	RPD			
Acenaphthene	S20-My41660	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Acenaphthylene	S20-My41660	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Anthracene	S20-My41660	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benz(a)anthracene	S20-My41660	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(a)pyrene	S20-My41660	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(b&j)fluoranthene	S20-My41660	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(g.h.i)perylene	S20-My41660	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Benzo(k)fluoranthene	S20-My41660	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Chrysene	S20-My41660	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Dibenz(a.h)anthracene	S20-My41660	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluoranthene	S20-My41660	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Fluorene	S20-My41660	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Indeno(1.2.3-cd)pyrene	S20-My41660	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Naphthalene	S20-My41660	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Phenanthrene	S20-My41660	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Pyrene	S20-My41660	NCP	mg/kg	< 0.5	< 0.5	<1	30%	Pass	
Duplicate									
Organochlorine Pesticides				Result 1	Result 2	RPD			
Chlordanes - Total	S20-My41660	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
4.4'-DDD	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDE	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
4.4'-DDT	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
a-BHC	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Aldrin	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
b-BHC	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
d-BHC	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Dieldrin	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan I	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan II	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endosulfan sulphate	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin aldehyde	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Endrin ketone	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
g-BHC (Lindane)	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Heptachlor epoxide	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Hexachlorobenzene	S20-My41660	NCP	mg/kg	< 0.05	< 0.05	<1	30%	Pass	
Methoxychlor	S20-My41660	NCP	mg/kg	< 0.2	< 0.2	<1	30%	Pass	
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-Jn02330	NCP	mg/kg	7.3	8.0	10	30%	Pass	
Cadmium	S20-Jn02330	NCP	mg/kg	< 0.4	< 0.4	<1	30%	Pass	
Chromium	S20-Jn02330	NCP	mg/kg	35	22	46	30%	Fail	Q15
Copper	S20-Jn02330	NCP	mg/kg	27	30	10	30%	Pass	
Lead	S20-Jn02330	NCP	mg/kg	18	20	10	30%	Pass	
Mercury	S20-Jn02330	NCP	mg/kg	< 0.1	< 0.1	<1	30%	Pass	
Nickel	S20-Jn02330	NCP	mg/kg	20	16	20	30%	Pass	
Zinc	S20-Jn02330	NCP	mg/kg	48	51	5.0	30%	Pass	
Duplicate									
				Result 1	Result 2	RPD			
% Moisture	S20-Jn02053	CP	%	19	19	4.0	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N01	F2 is determined by arithmetically subtracting the "naphthalene" value from the ">C10-C16" value. The naphthalene value used in this calculation is obtained from volatiles (Purge & Trap analysis).
N02	Where we have reported both volatile (P&T GCMS) and semivolatile (GCMS) naphthalene data, results may not be identical. Provided correct sample handling protocols have been followed, any observed differences in results are likely to be due to procedural differences within each methodology. Results determined by both techniques have passed all QAQC acceptance criteria, and are entirely technically valid.
N04	F1 is determined by arithmetically subtracting the "Total BTEX" value from the "C6-C10" value. The "Total BTEX" value is obtained by summing the concentrations of BTEX analytes. The "C6-C10" value is obtained by quantitating against a standard of mixed aromatic/aliphatic analytes.
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs
Q15	The RPD reported passes Eurofins Environment Testing's QC - Acceptance Criteria as defined in the Internal Quality Control Review and Glossary page of this report.

Authorised By

Ursula Long	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)
Nibha Vaidya	Senior Analyst-Asbestos (NSW)

Glenn Jackson

General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Chris Bielby**

Report **723042-L**
Project name PENRITH SOIL
Project ID 58140
Received Date Jun 01, 2020

Client Sample ID			**SV10 0.1-0.2**	**SV10 1.3-1.4**	**SV10 2.3-2.4**	**SV10 4.0-4.1**
Sample Matrix			**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**	**AUS Leachate - Reagent Water**
Eurofins Sample No.			**S20-Jn02064**	**S20-Jn02065**	**S20-Jn02066**	**S20-Jn02067**
Date Sampled			**May 29, 2020**	**May 29, 2020**	**May 29, 2020**	**May 29, 2020**
Test/Reference	LOR	Unit				
Volatile Organics						
1.1-Dichloroethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.1-Dichloroethene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.1.1-Trichloroethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.1.1.2-Tetrachloroethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.1.2-Trichloroethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.1.2.2-Tetrachloroethane	0.005	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
1.2-Dibromoethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.2-Dichlorobenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.2-Dichloroethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.2-Dichloropropane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.2.3-Trichloropropane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.2.4-Trimethylbenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.3-Dichlorobenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.3-Dichloropropane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.3.5-Trimethylbenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.4-Dichlorobenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
2-Butanone (MEK)	0.005	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
2-Propanone (Acetone)	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
4-Chlorotoluene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
4-Methyl-2-pentanone (MIBK)	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Allyl chloride	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Benzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Bromobenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Bromochloromethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Bromodichloromethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Bromoform	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Bromomethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Carbon disulfide	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Carbon Tetrachloride	0.005	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Chlorobenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Chloroethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Chloroform	0.02	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Chloromethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
cis-1.2-Dichloroethene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02

Client Sample ID			SV10 0.1-0.2	SV10 1.3-1.4	SV10 2.3-2.4	SV10 4.0-4.1
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			S20-Jn02064	S20-Jn02065	S20-Jn02066	S20-Jn02067
Date Sampled			May 29, 2020	May 29, 2020	May 29, 2020	May 29, 2020
Test/Reference	LOR	Unit				
Volatile Organics						
cis-1.3-Dichloropropene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Dibromochloromethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Dibromomethane	0.005	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Dichlorodifluoromethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Ethylbenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Iodomethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Isopropyl benzene (Cumene)	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
m&p-Xylenes	0.04	mg/L	< 0.04	< 0.04	< 0.04	< 0.04
Methylene Chloride	0.02	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
o-Xylene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Styrene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Tetrachloroethene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Toluene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
trans-1.2-Dichloroethene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
trans-1.3-Dichloropropene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Trichloroethene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Trichlorofluoromethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Vinyl chloride	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Xylenes - Total*	0.06	mg/L	< 0.06	< 0.06	< 0.06	< 0.06
Total MAH*	0.003	mg/L	< 0.04	< 0.04	< 0.04	< 0.04
Vic EPA IWRG 621 CHC (Total)*	0.02	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
4-Bromofluorobenzene (surr.)	1	%	125	110	109	100
Toluene-d8 (surr.)	0.02	%	142	139	141	141
AUS Leaching Procedure - ZHE						
Leachate Fluid		comment	4.0	4.0	4.0	4.0
pH (AUS ZHE - off)	0.1	pH Units	7.9	6.5	6.6	8.2
pH (Leachate Fluid)	0.1	pH Units	6.4	6.4	6.4	6.4

Client Sample ID			SV11 0.2-0.3	SV11 1.0-1.1	SV11 2.0-2.1	SV11 3.0-3.1
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			S20-Jn02068	S20-Jn02069	S20-Jn02070	S20-Jn02071
Date Sampled			May 29, 2020	May 29, 2020	May 29, 2020	May 29, 2020
Test/Reference	LOR	Unit				
Volatile Organics						
1.1-Dichloroethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.1-Dichloroethene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.1.1-Trichloroethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.1.1.2-Tetrachloroethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.1.2-Trichloroethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.1.2.2-Tetrachloroethane	0.005	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
1.2-Dibromoethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.2-Dichlorobenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.2-Dichloroethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.2-Dichloropropane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02

Client Sample ID			SV11 0.2-0.3	SV11 1.0-1.1	SV11 2.0-2.1	SV11 3.0-3.1
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			S20-Jn02068	S20-Jn02069	S20-Jn02070	S20-Jn02071
Date Sampled			May 29, 2020	May 29, 2020	May 29, 2020	May 29, 2020
Test/Reference	LOR	Unit				
Volatile Organics						
1.2.3-Trichloropropane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.2.4-Trimethylbenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.3-Dichlorobenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.3-Dichloropropane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.3.5-Trimethylbenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
1.4-Dichlorobenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
2-Butanone (MEK)	0.005	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
2-Propanone (Acetone)	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
4-Chlorotoluene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
4-Methyl-2-pentanone (MIBK)	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Allyl chloride	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Benzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Bromobenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Bromochloromethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Bromodichloromethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Bromoform	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Bromomethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Carbon disulfide	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Carbon Tetrachloride	0.005	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Chlorobenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Chloroethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Chloroform	0.02	mg/L	< 0.05	< 0.05	< 0.05	< 0.05
Chloromethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
cis-1.2-Dichloroethene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
cis-1.3-Dichloropropene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Dibromochloromethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Dibromomethane	0.005	mg/L	< 0.01	< 0.01	< 0.01	< 0.01
Dichlorodifluoromethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Ethylbenzene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Iodomethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Isopropyl benzene (Cumene)	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
m&p-Xylenes	0.04	mg/L	< 0.04	< 0.04	< 0.04	< 0.04
Methylene Chloride	0.02	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
o-Xylene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Styrene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Tetrachloroethene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Toluene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
trans-1.2-Dichloroethene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
trans-1.3-Dichloropropene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Trichloroethene	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Trichlorofluoromethane	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Vinyl chloride	0.02	mg/L	< 0.02	< 0.02	< 0.02	< 0.02
Xylenes - Total*	0.06	mg/L	< 0.06	< 0.06	< 0.06	< 0.06
Total MAH*	0.003	mg/L	< 0.04	< 0.04	< 0.04	< 0.04
Vic EPA IWRG 621 CHC (Total)*	0.02	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.1	< 0.1	< 0.1	< 0.1
4-Bromofluorobenzene (surr.)	1	%	114	109	113	112
Toluene-d8 (surr.)	0.02	%	145	137	139	136

Client Sample ID			SV11 0.2-0.3	SV11 1.0-1.1	SV11 2.0-2.1	SV11 3.0-3.1
Sample Matrix			AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water	AUS Leachate - Reagent Water
Eurofins Sample No.			S20-Jn02068	S20-Jn02069	S20-Jn02070	S20-Jn02071
Date Sampled			May 29, 2020	May 29, 2020	May 29, 2020	May 29, 2020
Test/Reference	LOR	Unit				
AUS Leaching Procedure - ZHE						
Leachate Fluid		comment	4.0	4.0	4.0	4.0
pH (AUS ZHE - off)	0.1	pH Units	11	5.9	6.0	6.0
pH (Leachate Fluid)	0.1	pH Units	6.4	6.4	6.4	6.4

Client Sample ID			SV11 4.0-4.1
Sample Matrix			AUS Leachate - Reagent Water
Eurofins Sample No.			S20-Jn02072
Date Sampled			May 29, 2020
Test/Reference	LOR	Unit	
Volatile Organics			
1.1-Dichloroethane	0.02	mg/L	< 0.02
1.1-Dichloroethene	0.02	mg/L	< 0.02
1.1.1-Trichloroethane	0.02	mg/L	< 0.02
1.1.1.2-Tetrachloroethane	0.02	mg/L	< 0.02
1.1.2-Trichloroethane	0.02	mg/L	< 0.02
1.1.2.2-Tetrachloroethane	0.005	mg/L	< 0.01
1.2-Dibromoethane	0.02	mg/L	< 0.02
1.2-Dichlorobenzene	0.02	mg/L	< 0.02
1.2-Dichloroethane	0.02	mg/L	< 0.02
1.2-Dichloropropane	0.02	mg/L	< 0.02
1.2.3-Trichloropropane	0.02	mg/L	< 0.02
1.2.4-Trimethylbenzene	0.02	mg/L	< 0.02
1.3-Dichlorobenzene	0.02	mg/L	< 0.02
1.3-Dichloropropane	0.02	mg/L	< 0.02
1.3.5-Trimethylbenzene	0.02	mg/L	< 0.02
1.4-Dichlorobenzene	0.02	mg/L	< 0.02
2-Butanone (MEK)	0.005	mg/L	< 0.01
2-Propanone (Acetone)	0.02	mg/L	< 0.02
4-Chlorotoluene	0.02	mg/L	< 0.02
4-Methyl-2-pentanone (MIBK)	0.02	mg/L	< 0.02
Allyl chloride	0.02	mg/L	< 0.02
Benzene	0.02	mg/L	< 0.02
Bromobenzene	0.02	mg/L	< 0.02
Bromochloromethane	0.02	mg/L	< 0.02
Bromodichloromethane	0.02	mg/L	< 0.02
Bromoform	0.02	mg/L	< 0.02
Bromomethane	0.02	mg/L	< 0.02
Carbon disulfide	0.02	mg/L	< 0.02
Carbon Tetrachloride	0.005	mg/L	< 0.01
Chlorobenzene	0.02	mg/L	< 0.02
Chloroethane	0.02	mg/L	< 0.02
Chloroform	0.02	mg/L	< 0.05
Chloromethane	0.02	mg/L	< 0.02
cis-1.2-Dichloroethene	0.02	mg/L	< 0.02
cis-1.3-Dichloropropene	0.02	mg/L	< 0.02

Client Sample ID			SV11 4.0-4.1
Sample Matrix			AUS Leachate - Reagent Water
Eurofins Sample No.			S20-Jn02072
Date Sampled			May 29, 2020
Test/Reference	LOR	Unit	
Volatile Organics			
Dibromochloromethane	0.02	mg/L	< 0.02
Dibromomethane	0.005	mg/L	< 0.01
Dichlorodifluoromethane	0.02	mg/L	< 0.02
Ethylbenzene	0.02	mg/L	< 0.02
Iodomethane	0.02	mg/L	< 0.02
Isopropyl benzene (Cumene)	0.02	mg/L	< 0.02
m&p-Xylenes	0.04	mg/L	< 0.04
Methylene Chloride	0.02	mg/L	< 0.1
o-Xylene	0.02	mg/L	< 0.02
Styrene	0.02	mg/L	< 0.02
Tetrachloroethene	0.02	mg/L	< 0.02
Toluene	0.02	mg/L	< 0.02
trans-1.2-Dichloroethene	0.02	mg/L	< 0.02
trans-1.3-Dichloropropene	0.02	mg/L	< 0.02
Trichloroethene	0.02	mg/L	< 0.02
Trichlorofluoromethane	0.02	mg/L	< 0.02
Vinyl chloride	0.02	mg/L	< 0.02
Xylenes - Total*	0.06	mg/L	< 0.06
Total MAH*	0.003	mg/L	< 0.04
Vic EPA IWRG 621 CHC (Total)*	0.02	mg/L	< 0.1
Vic EPA IWRG 621 Other CHC (Total)*	0.005	mg/L	< 0.1
4-Bromofluorobenzene (surr.)	1	%	116
Toluene-d8 (surr.)	0.02	%	137
AUS Leaching Procedure - ZHE			
Leachate Fluid		comment	4.0
pH (AUS ZHE - off)	0.1	pH Units	8.4
pH (Leachate Fluid)	0.1	pH Units	6.4

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Volatile Organics	Sydney	Jun 01, 2020	7 Days

- Method: LTM-ORG-2150 VOCs in Soils Liquid and other Aqueous Matrices

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IANZ # 1290

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH SOIL
Project ID: 58140

Order No.:
Report #: 723042
Phone: 02 8245 0300
Fax:

Received: Jun 1, 2020 4:48 PM
Due: Jun 3, 2020
Priority: 2 Day
Contact Name: Chris Bielby

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Suite B13: OCP/PCB	AUS Leaching Procedure - ZHE	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271														
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	SV10 0.1-0.2	May 29, 2020		Soil	S20-Jn02053	X			X		X	X	X	
2	SV10 1.3-1.4	May 29, 2020		Soil	S20-Jn02054						X	X		X
3	SV10 2.3-2.4	May 29, 2020		Soil	S20-Jn02055						X	X		X
4	SV10 4.0-4.1	May 29, 2020		Soil	S20-Jn02056						X	X		X
5	TS	May 29, 2020		Water	S20-Jn02057			X						
6	TB	May 29, 2020		Water	S20-Jn02058			X						
7	SV11 0.2-0.3	May 29, 2020		Soil	S20-Jn02059	X			X		X	X	X	
8	SV11 1.0-1.1	May 29, 2020		Soil	S20-Jn02060						X	X		X
9	SV11 2.0-2.1	May 29, 2020		Soil	S20-Jn02061						X	X		X
10	SV11 3.0-3.1	May 29, 2020		Soil	S20-Jn02062						X	X		X

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
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NSW 2000

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Received: Jun 1, 2020 4:48 PM
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Contact Name: Chris Bielby

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Suite B13: OCP/PCB	AUS Leaching Procedure - ZHE	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271														
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
11	SV11 4.0-4.1	May 29, 2020		Soil	S20-Jn02063						X	X		X
12	SV10 0.1-0.2	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02064					X	X			
13	SV10 1.3-1.4	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02065					X	X			
14	SV10 2.3-2.4	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02066					X	X			
15	SV10 4.0-4.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02067					X	X			
16	SV11 0.2-0.3	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02068					X	X			

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Melbourne Laboratory - NATA Site # 1254 & 14271														
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
17	SV11 1.0-1.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02069					X	X			
18	SV11 2.0-2.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02070					X	X			
19	SV11 3.0-3.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02071					X	X			
20	SV11 4.0-4.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02072					X	X			
21	SV10 0.5-0.6	May 29, 2020		Soil	S20-Jn02073		X							
22	SV10 3.4-3.5	May 29, 2020		Soil	S20-Jn02074		X							
23	SV11 0-0.1	May 29, 2020		Soil	S20-Jn02075		X							

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IANZ # 1290

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH SOIL
Project ID: 58140

Order No.:
Report #: 723042
Phone: 02 8245 0300
Fax:

Received: Jun 1, 2020 4:48 PM
Due: Jun 3, 2020
Priority: 2 Day
Contact Name: Chris Bielby

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Suite B13: OCP/PCB	AUS Leaching Procedure - ZHE	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271														
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
24	SV11 0.5-0.6	May 29, 2020		Soil	S20-Jn02076		X							
25	SV11 2.5-2.6	May 29, 2020		Soil	S20-Jn02077		X							
26	SV11 3.5-3.6	May 29, 2020		Soil	S20-Jn02078		X							
27	QC01	May 29, 2020		Soil	S20-Jn02079		X							
28	QA01	May 29, 2020		Soil	S20-Jn02080		X							
Test Counts						2	8	2	2	9	18	9	2	7

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram | **mg/L:** milligrams per litre | **ug/L:** micrograms per litre

ppm: Parts per million | **ppb:** Parts per billion | **%:** Percentage

org/100mL: Organisms per 100 millilitres | **NTU:** Nephelometric Turbidity Units | **MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Volatile Organics							
1.1-Dichloroethane	mg/L	< 0.02			0.02	Pass	
1.1-Dichloroethene	mg/L	< 0.02			0.02	Pass	
1.1.1-Trichloroethane	mg/L	< 0.02			0.02	Pass	
1.1.1.2-Tetrachloroethane	mg/L	< 0.02			0.02	Pass	
1.1.2-Trichloroethane	mg/L	< 0.02			0.02	Pass	
1.1.2.2-Tetrachloroethane	mg/L	< 0.005			0.005	Pass	
1.2-Dibromoethane	mg/L	< 0.02			0.02	Pass	
1.2-Dichlorobenzene	mg/L	< 0.02			0.02	Pass	
1.2-Dichloroethane	mg/L	< 0.02			0.02	Pass	
1.2-Dichloropropane	mg/L	< 0.02			0.02	Pass	
1.2.3-Trichloropropane	mg/L	< 0.02			0.02	Pass	
1.2.4-Trimethylbenzene	mg/L	< 0.02			0.02	Pass	
1.3-Dichlorobenzene	mg/L	< 0.02			0.02	Pass	
1.3-Dichloropropane	mg/L	< 0.02			0.02	Pass	
1.3.5-Trimethylbenzene	mg/L	< 0.02			0.02	Pass	
1.4-Dichlorobenzene	mg/L	< 0.02			0.02	Pass	
2-Butanone (MEK)	mg/L	< 0.005			0.005	Pass	
2-Propanone (Acetone)	mg/L	< 0.02			0.02	Pass	
4-Chlorotoluene	mg/L	< 0.02			0.02	Pass	
4-Methyl-2-pentanone (MIBK)	mg/L	< 0.02			0.02	Pass	
Allyl chloride	mg/L	< 0.02			0.02	Pass	
Benzene	mg/L	< 0.02			0.02	Pass	
Bromobenzene	mg/L	< 0.02			0.02	Pass	
Bromochloromethane	mg/L	< 0.02			0.02	Pass	
Bromodichloromethane	mg/L	< 0.02			0.02	Pass	
Bromoform	mg/L	< 0.02			0.02	Pass	
Bromomethane	mg/L	< 0.02			0.02	Pass	
Carbon disulfide	mg/L	< 0.02			0.02	Pass	
Carbon Tetrachloride	mg/L	< 0.005			0.005	Pass	
Chlorobenzene	mg/L	< 0.02			0.02	Pass	
Chloroethane	mg/L	< 0.02			0.02	Pass	
Chloroform	mg/L	< 0.02			0.02	Pass	
Chloromethane	mg/L	< 0.02			0.02	Pass	
cis-1.2-Dichloroethene	mg/L	< 0.02			0.02	Pass	
cis-1.3-Dichloropropene	mg/L	< 0.02			0.02	Pass	
Dibromochloromethane	mg/L	< 0.02			0.02	Pass	
Dibromomethane	mg/L	< 0.005			0.005	Pass	
Dichlorodifluoromethane	mg/L	< 0.02			0.02	Pass	
Ethylbenzene	mg/L	< 0.02			0.02	Pass	
Iodomethane	mg/L	< 0.02			0.02	Pass	
Isopropyl benzene (Cumene)	mg/L	< 0.02			0.02	Pass	
m&p-Xylenes	mg/L	< 0.04			0.04	Pass	
Methylene Chloride	mg/L	< 0.02			0.02	Pass	
o-Xylene	mg/L	< 0.02			0.02	Pass	
Styrene	mg/L	< 0.02			0.02	Pass	
Tetrachloroethene	mg/L	< 0.02			0.02	Pass	
Toluene	mg/L	< 0.02			0.02	Pass	
trans-1.2-Dichloroethene	mg/L	< 0.02			0.02	Pass	
trans-1.3-Dichloropropene	mg/L	< 0.02			0.02	Pass	
Trichloroethene	mg/L	< 0.02			0.02	Pass	

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Trichlorofluoromethane	mg/L	< 0.02			0.02	Pass	
Vinyl chloride	mg/L	< 0.02			0.02	Pass	
Xylenes - Total*	mg/L	< 0.06			0.06	Pass	
LCS - % Recovery							
Volatile Organics							
1.1-Dichloroethene	%	127			70-130	Pass	
1.1.1-Trichloroethane	%	117			70-130	Pass	
1.2-Dichlorobenzene	%	121			70-130	Pass	
1.2-Dichloroethane	%	115			70-130	Pass	
Benzene	%	115			70-130	Pass	
Ethylbenzene	%	102			70-130	Pass	
m&p-Xylenes	%	125			70-130	Pass	
o-Xylene	%	118			70-130	Pass	
Toluene	%	129			70-130	Pass	
Trichloroethene	%	119			70-130	Pass	
Xylenes - Total*	%	122			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
1.1-Dichloroethane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
1.1-Dichloroethene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
1.1.1-Trichloroethane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
1.1.1.2-Tetrachloroethane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
1.1.2-Trichloroethane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
1.1.2.2-Tetrachloroethane	S20-Jn02064	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
1.2-Dibromoethane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
1.2-Dichlorobenzene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
1.2-Dichloroethane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
1.2-Dichloropropane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
1.2.3-Trichloropropane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
1.2.4-Trimethylbenzene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
1.3-Dichlorobenzene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
1.3-Dichloropropane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
1.3.5-Trimethylbenzene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
1.4-Dichlorobenzene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
2-Butanone (MEK)	S20-Jn02064	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
2-Propanone (Acetone)	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
4-Chlorotoluene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
4-Methyl-2-pentanone (MIBK)	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Allyl chloride	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Benzene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Bromobenzene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Bromochloromethane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Bromodichloromethane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Bromoform	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Bromomethane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Carbon disulfide	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Carbon Tetrachloride	S20-Jn02064	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Chlorobenzene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Chloroethane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Chloroform	S20-Jn02064	CP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Chloromethane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
cis-1.2-Dichloroethene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
cis-1.3-Dichloropropene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
Volatile Organics				Result 1	Result 2	RPD			
Dibromochloromethane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Dibromomethane	S20-Jn02064	CP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Dichlorodifluoromethane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Ethylbenzene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Iodomethane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Isopropyl benzene (Cumene)	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
m&p-Xylenes	S20-Jn02064	CP	mg/L	< 0.04	< 0.04	<1	30%	Pass	
Methylene Chloride	S20-Jn02064	CP	mg/L	< 0.1	< 0.1	<1	30%	Pass	
o-Xylene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Styrene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Tetrachloroethene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Toluene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
trans-1.2-Dichloroethene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
trans-1.3-Dichloropropene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Trichloroethene	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Trichlorofluoromethane	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Vinyl chloride	S20-Jn02064	CP	mg/L	< 0.02	< 0.02	<1	30%	Pass	
Xylenes - Total*	S20-Jn02064	CP	mg/L	< 0.06	< 0.06	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By

Ursula Long Analytical Services Manager

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

eurofins | Environment Testing

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Chris Bielby**

Report **723042-W**
Project name PENRITH SOIL
Project ID 58140
Received Date Jun 01, 2020

Client Sample ID			R20**TS**	**TB**
Sample Matrix			**Water**	**Water**
Eurofins Sample No.			**S20-Jn02057**	**S20-Jn02058**
Date Sampled			**May 29, 2020**	**May 29, 2020**
Test/Reference	LOR	Unit		
BTEX				
Benzene	0.001	mg/L	110	< 0.001
Toluene	0.001	mg/L	110	< 0.001
Ethylbenzene	0.001	mg/L	100	< 0.001
m&p-Xylenes	0.002	mg/L	95	< 0.002
o-Xylene	0.001	mg/L	110	< 0.001
Xylenes - Total*	0.003	mg/L	99	< 0.003
4-Bromofluorobenzene (surr.)	1	%	112	114

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Eurofins | mgt Suite B1			
BTEX	Sydney	Jun 01, 2020	14 Days
- Method: LTM-ORG-2010 TRH C6-C40			

eurofins | Environment Testing

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IANZ # 1290

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Address: Level 1, 50 Margaret St
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NSW 2000

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Received: Jun 1, 2020 4:48 PM
Due: Jun 3, 2020
Priority: 2 Day
Contact Name: Chris Bielby

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Suite B13: OCP/PCB	AUS Leaching Procedure - ZHE	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271														
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	SV10 0.1-0.2	May 29, 2020		Soil	S20-Jn02053	X			X		X	X	X	
2	SV10 1.3-1.4	May 29, 2020		Soil	S20-Jn02054						X	X		X
3	SV10 2.3-2.4	May 29, 2020		Soil	S20-Jn02055						X	X		X
4	SV10 4.0-4.1	May 29, 2020		Soil	S20-Jn02056						X	X		X
5	TS	May 29, 2020		Water	S20-Jn02057			X						
6	TB	May 29, 2020		Water	S20-Jn02058			X						
7	SV11 0.2-0.3	May 29, 2020		Soil	S20-Jn02059	X			X		X	X	X	
8	SV11 1.0-1.1	May 29, 2020		Soil	S20-Jn02060						X	X		X
9	SV11 2.0-2.1	May 29, 2020		Soil	S20-Jn02061						X	X		X
10	SV11 3.0-3.1	May 29, 2020		Soil	S20-Jn02062						X	X		X

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eurofins | Environment Testing

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Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH SOIL
Project ID: 58140

Order No.:
Report #: 723042
Phone: 02 8245 0300
Fax:

Received: Jun 1, 2020 4:48 PM
Due: Jun 3, 2020
Priority: 2 Day
Contact Name: Chris Bielby

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Suite B13: OCP/PCB	AUS Leaching Procedure - ZHE	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271														
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
11	SV11 4.0-4.1	May 29, 2020		Soil	S20-Jn02063						X	X		X
12	SV10 0.1-0.2	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02064					X	X			
13	SV10 1.3-1.4	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02065					X	X			
14	SV10 2.3-2.4	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02066					X	X			
15	SV10 4.0-4.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02067					X	X			
16	SV11 0.2-0.3	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02068					X	X			

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
17	SV11 1.0-1.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02069					X	X			
18	SV11 2.0-2.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02070					X	X			
19	SV11 3.0-3.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02071					X	X			
20	SV11 4.0-4.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02072					X	X			
21	SV10 0.5-0.6	May 29, 2020		Soil	S20-Jn02073		X							
22	SV10 3.4-3.5	May 29, 2020		Soil	S20-Jn02074		X							
23	SV11 0-0.1	May 29, 2020		Soil	S20-Jn02075		X							

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
24	SV11 0.5-0.6	May 29, 2020		Soil	S20-Jn02076		X							
25	SV11 2.5-2.6	May 29, 2020		Soil	S20-Jn02077		X							
26	SV11 3.5-3.6	May 29, 2020		Soil	S20-Jn02078		X							
27	QC01	May 29, 2020		Soil	S20-Jn02079		X							
28	QA01	May 29, 2020		Soil	S20-Jn02080		X							
Test Counts						2	8	2	2	9	18	9	2	7

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Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram | **mg/L:** milligrams per litre | **ug/L:** micrograms per litre

ppm: Parts per million | **ppb:** Parts per billion | **%:** Percentage

org/100mL: Organisms per 100 millilitres | **NTU:** Nephelometric Turbidity Units | **MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
BTEX							
Benzene	mg/L	< 0.001			0.001	Pass	
Toluene	mg/L	< 0.001			0.001	Pass	
Ethylbenzene	mg/L	< 0.001			0.001	Pass	
m&p-Xylenes	mg/L	< 0.002			0.002	Pass	
o-Xylene	mg/L	< 0.001			0.001	Pass	
Xylenes - Total*	mg/L	< 0.003			0.003	Pass	
LCS - % Recovery							
BTEX							
Benzene	%	116			70-130	Pass	
Toluene	%	115			70-130	Pass	
Ethylbenzene	%	112			70-130	Pass	
m&p-Xylenes	%	111			70-130	Pass	
o-Xylene	%	121			70-130	Pass	
Xylenes - Total*	%	114			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Spike - % Recovery									
BTEX				Result 1					
Benzene	S20-Jn02346	NCP	%	90			70-130	Pass	
Toluene	S20-Jn02346	NCP	%	100			70-130	Pass	
Ethylbenzene	S20-Jn02346	NCP	%	91			70-130	Pass	
m&p-Xylenes	S20-Jn02346	NCP	%	93			70-130	Pass	
o-Xylene	S20-Jn02346	NCP	%	96			70-130	Pass	
Xylenes - Total*	S20-Jn02346	NCP	%	94			70-130	Pass	

Test	Lab Sample ID	QA Source	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Duplicate									
BTEX				Result 1	Result 2	RPD			
Benzene	S20-Jn02345	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Toluene	S20-Jn02345	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Ethylbenzene	S20-Jn02345	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
m&p-Xylenes	S20-Jn02345	NCP	mg/L	< 0.002	< 0.002	<1	30%	Pass	
o-Xylene	S20-Jn02345	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Xylenes - Total*	S20-Jn02345	NCP	mg/L	< 0.003	< 0.003	<1	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
R20	This sample is a Trip Spike and therefore all results are reported as a percentage

Authorised By

Ursula Long Analytical Services Manager

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Certificate of Analysis

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NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025–Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

Attention:	Chris Bielby
Report	723042-AID
Project Name	PENRITH SOIL
Project ID	58140
Received Date	Jun 01, 2020
Date Reported	Jun 04, 2020

Methodology:

Asbestos Fibre Identification	Conducted in accordance with the Australian Standard AS 4964 – 2004: Method for the Qualitative Identification of Asbestos in Bulk Samples and in-house Method LTM-ASB-8020 by polarised light microscopy (PLM) and dispersion staining (DS) techniques. *NOTE: Positive Trace Analysis results indicate the sample contains detectable respirable fibres.*
Unknown Mineral Fibres	Mineral fibres of unknown type, as determined by PLM with DS, may require another analytical technique, such as Electron Microscopy, to confirm unequivocal identity. *NOTE: While Actinolite, Anthophyllite and Tremolite asbestos may be detected by PLM with DS, due to variability in the optical properties of these materials, AS4964 requires that these are reported as UMF unless confirmed by an independent technique.*
Subsampling Soil Samples	The whole sample submitted is first dried and then passed through a 10mm sieve followed by a 2mm sieve. All fibrous matter greater than 10mm, greater than 2mm as well as the material passing through the 2mm sieve are retained and analysed for the presence of asbestos. If the sub 2mm fraction is greater than approximately 30 to 60g then a sub-sampling routine based on ISO 3082:2009(E) is employed. *NOTE: Depending on the nature and size of the soil sample, the sub-2 mm residue material may need to be sub-sampled for trace analysis, in accordance with AS 4964-2004.*
Bonded asbestos-containing material (ACM)	The material is first examined and any fibres isolated for identification by PLM and DS. Where required, interfering matrices may be removed by disintegration using a range of heat, chemical or physical treatments, possibly in combination.The resultant material is then further examined in accordance with AS 4964 - 2004. *NOTE: Even after disintegration it may be difficult to detect the presence of asbestos in some asbestos-containing bulk materials using PLM and DS. This is due to the low grade or small length or diameter of the asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials. Vinyl/asbestos floor tiles, some asbestos-containing sealants and mastics, asbestos-containing epoxy resins and some ore samples are examples of these types of material, which are difficult to analyse.*
Limit of Reporting	The performance limitation of the AS 4964 (2004) method for non-homogeneous samples is around 0.1 g/kg (equivalent to 0.01% (w/w)). Where no asbestos is found by PLM and DS, including Trace Analysis, this is considered to be at the nominal reporting limit of 0.01% (w/w). The NEPM screening level of 0.001% (w/w) is intended as an on-site determination, not a laboratory Limit of Reporting (LOR), per se. Examination of a large sample size (e.g. 500 mL) may improve the likelihood of detecting asbestos, particularly AF, to aid assessment against the NEPM criteria. Gravimetric determinations to this level of accuracy are outside of AS 4964 and hence NATA Accreditation does not cover the performance of this service (non-NATA results shown with an asterisk). *NOTE: NATA News March 2014, p.7, states in relation to AS 4964: "This is a qualitative method with a nominal reporting limit of 0.01 % " and that currently in Australia "there is no validated method available for the quantification of asbestos".This report is consistent with the analytical procedures and reporting recommendations in the NEPM and the WA DoH.*

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Project Name PENRITH SOIL
Project ID 58140
Date Sampled May 29, 2020
Report 723042-AID

Client Sample ID	Eurofins Sample No.	Date Sampled	Sample Description	Result
SV10 0.1-0.2	20-Jn02053	May 29, 2020	Approximate Sample 469g Sample consisted of: Brown coarse-grained clayey soil and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.
SV11 0.2-0.3	20-Jn02059	May 29, 2020	Approximate Sample 510g Sample consisted of: Brown coarse-grained clayey soil, cement fragments and rocks	No asbestos detected at the reporting limit of 0.001% w/w.* Organic fibre detected. No trace asbestos detected.

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Asbestos - LTM-ASB-8020	Sydney	Jun 01, 2020	Indefinite

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Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
External Laboratory														
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**									
1	SV10 0.1-0.2	May 29, 2020		Soil	S20-Jn02053	X			X		X	X	X	
2	SV10 1.3-1.4	May 29, 2020		Soil	S20-Jn02054						X	X		X
3	SV10 2.3-2.4	May 29, 2020		Soil	S20-Jn02055						X	X		X
4	SV10 4.0-4.1	May 29, 2020		Soil	S20-Jn02056						X	X		X
5	TS	May 29, 2020		Water	S20-Jn02057			X						
6	TB	May 29, 2020		Water	S20-Jn02058			X						
7	SV11 0.2-0.3	May 29, 2020		Soil	S20-Jn02059	X			X		X	X	X	
8	SV11 1.0-1.1	May 29, 2020		Soil	S20-Jn02060						X	X		X
9	SV11 2.0-2.1	May 29, 2020		Soil	S20-Jn02061						X	X		X
10	SV11 3.0-3.1	May 29, 2020		Soil	S20-Jn02062						X	X		X

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Perth
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NATA # 1261
Site # 23736

New Zealand

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Penrose, Auckland 1061
Phone : +64 9 526 45 51
IANZ # 1327

Christchurch
43 Detroit Drive
Rolleston, Christchurch 7675
Phone : 0800 856 450
IANZ # 1290

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: PENRITH SOIL
Project ID: 58140

Order No.:
Report #: 723042
Phone: 02 8245 0300
Fax:

Received: Jun 1, 2020 4:48 PM
Due: Jun 3, 2020
Priority: 2 Day
Contact Name: Chris Bielby

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Suite B13: OCP/PCB	AUS Leaching Procedure - ZHE	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271														
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
17	SV11 1.0-1.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02069					X	X			
18	SV11 2.0-2.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02070					X	X			
19	SV11 3.0-3.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02071					X	X			
20	SV11 4.0-4.1	May 29, 2020		AUS Leachate - Reagent Water	S20-Jn02072					X	X			
21	SV10 0.5-0.6	May 29, 2020		Soil	S20-Jn02073		X							
22	SV10 3.4-3.5	May 29, 2020		Soil	S20-Jn02074		X							
23	SV11 0-0.1	May 29, 2020		Soil	S20-Jn02075		X							

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Sample Detail						Asbestos - WA guidelines	HOLD	BTEX	Suite B13: OCP/PCB	AUS Leaching Procedure - ZHE	Volatile Organics	Moisture Set	Eurofins | mgt Suite B7	Eurofins | mgt Suite B1
Melbourne Laboratory - NATA Site # 1254 & 14271														
Sydney Laboratory - NATA Site # 18217						X	X	X	X	X	X	X	X	X
Brisbane Laboratory - NATA Site # 20794														
Perth Laboratory - NATA Site # 23736														
24	SV11 0.5-0.6	May 29, 2020		Soil	S20-Jn02076		X							
25	SV11 2.5-2.6	May 29, 2020		Soil	S20-Jn02077		X							
26	SV11 3.5-3.6	May 29, 2020		Soil	S20-Jn02078		X							
27	QC01	May 29, 2020		Soil	S20-Jn02079		X							
28	QA01	May 29, 2020		Soil	S20-Jn02080		X							
Test Counts						2	8	2	2	9	18	9	2	7

Internal Quality Control Review and Glossary

General

1. QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Samples were analysed on an 'as received' basis.
4. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
5. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Advice.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

Units

% w/w: weight for weight basis	grams per kilogram
Filter loading:	fibres/100 graticule areas
Reported Concentration:	fibres/mL
Flowrate:	L/min

Terms

Dry	Sample is dried by heating prior to analysis
LOR	Limit of Reporting
COC	Chain of Custody
SRA	Sample Receipt Advice
ISO	International Standards Organisation
AS	Australian Standards
WA DOH	Reference document for the NEPM. Government of Western Australia, Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009), including supporting document Recommended Procedures for Laboratory Analysis of Asbestos in Soil (2011)
NEPM	National Environment Protection (Assessment of Site Contamination) Measure, 2013 (as amended)
ACM	Asbestos Containing Materials. Asbestos contained within a non-asbestos matrix, typically presented in bonded and/or sound condition. For the purposes of the NEPM, ACM is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
AF	Asbestos Fines. Asbestos containing materials, including friable, weathered and bonded materials, able to pass a 7mm x 7mm sieve. Considered under the NEPM as equivalent to “non-bonded / friable”.
FA	Fibrous Asbestos. Asbestos containing materials in a friable and/or severely weathered condition. For the purposes of the NEPM, FA is generally restricted to those materials that do not pass a 7mm x 7mm sieve.
Friable	Asbestos-containing materials of any size that may be broken or crumbled by hand pressure. For the purposes of the NEPM, this includes both AF and FA. It is outside of the laboratory’s remit to assess degree of friability.
Trace Analysis	Analytical procedure used to detect the presence of respirable fibres in the matrix.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Comments

S20-Jn02053: Sample received was less than the nominal 500mL as recommended in Section 4.10 of the NEPM Schedule B1 - Guideline on Investigation Levels for Soil and Groundwater.

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
N/A	Not applicable

Asbestos Counter/Identifier:

Chamath JHM Annakkage	Senior Analyst-Asbestos (NSW)

Authorised by:

Sayeed Abu	Senior Analyst-Asbestos (NSW)

Glenn Jackson
General Manager

Final Report – this report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

Eurofins shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall Eurofins be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

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Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Chris Bielby
Project name: PENRITH SOIL
Project ID: 58140
COC number: Not provided
Turn around time: 2 Day
Date/Time received: Jun 1, 2020 4:48 PM
Eurofins reference: **723042**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 14.2 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☑ Sample containers for volatile analysis received with zero headspace.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Ursula Long on Phone : or by e.mail: UrsulaLong@eurofins.com

Results will be delivered electronically via e.mail to Chris Bielby - cbielby@jbsg.com.au.

Chain of Custody

Eurofins 1611

JBS&G

PROJECT NO.: 58140	LABORATORY BATCH NO.: 723042
PROJECT NAME: Penrith Soil	SAMPLERS: MW
DATE NEEDED BY: 48hrs	QC LEVEL: NEPM (2013)

PHONE: Sydney 02 8245 0300 | Perth 08 9488 0100 | Brisbane 07 3112 2688 | Melbourne 03 9642 0599 | Adelaide 08 8431 7113

SEND REPORT & INVOICE TO: (1) adminnsw@jbsg.com.au; (2) Cbiella@jbsg.com.au; (3) mnavigato@jbsg.com.au

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	Asbestos Presence	TRH/BTEX	PAHs	OCP/PCBs	Asbestos	VOCs	ASLP VOCs	SVOCs	TYPE OF ASBESTOS ANALYSIS: IDENTIFICATION	TYPE OF ASBESTOS ANALYSIS: NEPM/WA	NOTES:
SV 10 0.1-0.2	Soil	29/5		B, Jtice		X	X	X	X	X	X	X				
0.5-0.6																
1.3-1.4				Jtice			X				X	X				
2.3-2.4							X				X	X				
3.4-3.5																
4.0-4.1							X				X	X				
TS/TB	Water			Vials tice									X			
SV 11 0-0.1	Soil			Jtice												
0.2-0.3				B, Jtice		X	X	X	X	X	X	X				
0.5-0.6				Jtice												
1.0-1.1							X				X	X				
2.0-2.1							X				X	X				
2.5-2.6																
3.0-3.1							X				X	X				
3.5-3.6																
4.0-4.1				Jtice			X				X	X				
QC01																
QA01																

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: M Navigato DATE: 1/6/20	CONSIGNMENT NOTE NO.	NAME: Grace	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS&G	TRANSPORT CO.	DATE: 1/6	14.1 6
		OF: Eurofins	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS & G Australia (NSW) P/L
Level 1, 50 Margaret St
Sydney
NSW 2000

NATA Accredited
Accreditation Number 1261
Site Number 18217

Accredited for compliance with ISO/IEC 17025 – Testing
The results of the tests, calibrations and/or measurements included in this document are traceable to Australian/national standards.

Attention: **Chris Bielby**

Report **724725-L**
Project name ADDITIONAL PENRITH SOIL
Project ID 58140
Received Date Jun 10, 2020

Client Sample ID			**SV10 0.1-0.2**
Sample Matrix			**US Leachate**
Eurofins Sample No.			**S20-Jn16039**
Date Sampled			**May 29, 2020**
Test/Reference	LOR	Unit	
Polycyclic Aromatic Hydrocarbons			
Acenaphthene	0.001	mg/L	< 0.001
Acenaphthylene	0.001	mg/L	< 0.001
Anthracene	0.001	mg/L	< 0.001
Benz(a)anthracene	0.001	mg/L	< 0.001
Benzo(a)pyrene	0.001	mg/L	< 0.001
Benzo(b&j)fluoranthene[N07]	0.001	mg/L	< 0.001
Benzo(g.h.i)perylene	0.001	mg/L	< 0.001
Benzo(k)fluoranthene	0.001	mg/L	< 0.001
Chrysene	0.001	mg/L	< 0.001
Dibenz(a.h)anthracene	0.001	mg/L	< 0.001
Fluoranthene	0.001	mg/L	< 0.001
Fluorene	0.001	mg/L	< 0.001
Indeno(1.2.3-cd)pyrene	0.001	mg/L	< 0.001
Naphthalene	0.001	mg/L	< 0.001
Phenanthrene	0.001	mg/L	< 0.001
Pyrene	0.001	mg/L	< 0.001
Total PAH*	0.001	mg/L	< 0.001
2-Fluorobiphenyl (surr.)	1	%	111
p-Terphenyl-d14 (surr.)	1	%	INT
Heavy Metals			
Arsenic	0.01	mg/L	< 0.01
Cadmium	0.005	mg/L	< 0.005
Chromium	0.05	mg/L	< 0.05
Copper	0.05	mg/L	< 0.05
Lead	0.01	mg/L	< 0.01
Mercury	0.001	mg/L	< 0.001
Nickel	0.01	mg/L	0.03
Zinc	0.05	mg/L	0.12
USA Leaching Procedure			
Leachate Fluid[C01]		comment	1.0
pH (initial)	0.1	pH Units	7.6
pH (off)	0.1	pH Units	5.0
pH (USA HCl addition)	0.1	pH Units	1.6

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.
A recent review of our LIMS has resulted in the correction or clarification of some method identifications. Due to this, some of the method reference information on reports has changed. However, no substantive change has been made to our laboratory methods, and as such there is no change in the validity of current or previous results.

If the date and time of sampling are not provided, the Laboratory will not be responsible for compromised results should testing be performed outside the recommended holding time.

Description	Testing Site	Extracted	Holding Time
Polycyclic Aromatic Hydrocarbons	Sydney	Jun 10, 2020	7 Days
- Method: LTM-ORG-2130 PAH and Phenols in Soil and Water			
Metals M8	Sydney	Jun 11, 2020	180 Days
- Method: LTM-MET-3040 Metals in Waters, Soils & Sediments by ICP-MS			
USA Leaching Procedure	Sydney	Jun 10, 2020	14 Days
- Method: LTM-GEN-7010 Leaching Procedure for Soils & Solid Wastes			

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IANZ # 1290

Company Name: JBS & G Australia (NSW) P/L
Address: Level 1, 50 Margaret St
Sydney
NSW 2000

Project Name: ADDITIONAL PENRITH SOIL
Project ID: 58140

Order No.:
Report #: 724725
Phone: 02 8245 0300
Fax:

Received: Jun 10, 2020 6:10 PM
Due: Jun 11, 2020
Priority: 1 Day
Contact Name: Chris Bielby

Eurofins Analytical Services Manager : Ursula Long

Sample Detail						Polycyclic Aromatic Hydrocarbons	USA Leaching Procedure	Metals M8
Melbourne Laboratory - NATA Site # 1254 & 14271								
Sydney Laboratory - NATA Site # 18217						X	X	X
Brisbane Laboratory - NATA Site # 20794								
Perth Laboratory - NATA Site # 23736								
External Laboratory								
No	**Sample ID**	**Sample Date**	**Sampling Time**	**Matrix**	**LAB ID**			
1	SV10 0.1-0.2	May 29, 2020		US Leachate	S20-Jn16039	X	X	X
Test Counts						1	1	1

Internal Quality Control Review and Glossary

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples follows guidelines delineated in the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013 and are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil/sediment/solid results are reported on a dry basis, unless otherwise stated.
3. All biota/food results are reported on a wet weight basis on the edible portion, unless otherwise stated.
4. Actual LORs are matrix dependant. Quoted LORs may be raised where sample extracts are diluted due to interferences.
5. Results are uncorrected for matrix spikes or surrogate recoveries except for PFAS compounds.
6. SVOC analysis on waters are performed on homogenised, unfiltered samples, unless noted otherwise.
7. Samples were analysed on an 'as received' basis.
8. Information identified on this report with blue colour, indicates data provided by customer, that may have an impact on the results.
9. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sample Preservation and Container Guide' for holding times (QS3001).

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the SRA.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitably qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

For VOCs containing vinyl chloride, styrene and 2-chloroethyl vinyl ether the holding time is 7 days however for all other VOCs such as BTEX or C6-10 TRH then the holding time is 14 days.

****NOTE:** pH duplicates are reported as a range NOT as RPD

Units

mg/kg: milligrams per kilogram | **mg/L:** milligrams per litre | **ug/L:** micrograms per litre

ppm: Parts per million | **ppb:** Parts per billion | **%:** Percentage

org/100mL: Organisms per 100 millilitres | **NTU:** Nephelometric Turbidity Units | **MPN/100mL:** Most Probable Number of organisms per 100 millilitres

Terms

Dry	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR	Limit of Reporting.
SPIKE	Addition of the analyte to the sample and reported as percentage recovery.
RPD	Relative Percent Difference between two Duplicate pieces of analysis.
LCS	Laboratory Control Sample - reported as percent recovery.
CRM	Certified Reference Material - reported as percent recovery.
Method Blank	In the case of solid samples these are performed on laboratory certified clean sands and in the case of water samples these are performed on de-ionised water.
Surr - Surrogate	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
USEPA	United States Environmental Protection Agency
APHA	American Public Health Association
TCLP	Toxicity Characteristic Leaching Procedure
COC	Chain of Custody
SRA	Sample Receipt Advice
QSM	US Department of Defense Quality Systems Manual Version 5.3
CP	Client Parent - QC was performed on samples pertaining to this report
NCP	Non-Client Parent - QC performed on samples not pertaining to this report, QC is representative of the sequence or batch that client samples were analysed within.
TEQ	Toxic Equivalency Quotient

QC - Acceptance Criteria

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times the LOR : RPD must lie between 0-50%

Results >20 times the LOR : RPD must lie between 0-30%

Surrogate Recoveries: Recoveries must lie between 20-130% Phenols & 50-150% PFASs

PFAS field samples that contain surrogate recoveries in excess of the QC limit designated in QSM 5.3 where no positive PFAS results have been reported have been reviewed and no data was affected.

WA DWER (n=10): PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFBS, PFHxS, PFOS, 6:2 FTSA, 8:2 FTSA

QC Data General Comments

1. Where a result is reported as a less than (<), higher than the nominated LOR, this is due to either matrix interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch at a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. pH and Free Chlorine analysed in the laboratory - Analysis on this test must begin within 30 minutes of sampling.Therefore laboratory analysis is unlikely to be completed within holding time. Analysis will begin as soon as possible after sample receipt.
7. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
8. Polychlorinated Biphenyls are spiked only using Aroclor 1260 in Matrix Spikes and LCS.
9. For Matrix Spikes and LCS results a dash " -" in the report means that the specific analyte was not added to the QC sample.
10. Duplicate RPDs are calculated from raw analytical data thus it is possible to have two sets of data.

Quality Control Results

Test	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Method Blank							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	mg/L	< 0.001			0.001	Pass	
Acenaphthylene	mg/L	< 0.001			0.001	Pass	
Anthracene	mg/L	< 0.001			0.001	Pass	
Benzo(a)pyrene	mg/L	< 0.001			0.001	Pass	
Benzo(b&j)fluoranthene	mg/L	< 0.001			0.001	Pass	
Benzo(g.h.i)perylene	mg/L	< 0.001			0.001	Pass	
Benzo(k)fluoranthene	mg/L	< 0.001			0.001	Pass	
Chrysene	mg/L	< 0.001			0.001	Pass	
Dibenz(a.h)anthracene	mg/L	< 0.001			0.001	Pass	
Fluoranthene	mg/L	< 0.001			0.001	Pass	
Fluorene	mg/L	< 0.001			0.001	Pass	
Indeno(1.2.3-cd)pyrene	mg/L	< 0.001			0.001	Pass	
Naphthalene	mg/L	< 0.001			0.001	Pass	
Phenanthrene	mg/L	< 0.001			0.001	Pass	
Pyrene	mg/L	< 0.001			0.001	Pass	
Method Blank							
Heavy Metals							
Arsenic	mg/L	< 0.01			0.01	Pass	
Cadmium	mg/L	< 0.005			0.005	Pass	
Chromium	mg/L	< 0.05			0.05	Pass	
Copper	mg/L	< 0.05			0.05	Pass	
Lead	mg/L	< 0.01			0.01	Pass	
Mercury	mg/L	< 0.001			0.001	Pass	
Nickel	mg/L	< 0.01			0.01	Pass	
Zinc	mg/L	< 0.05			0.05	Pass	
LCS - % Recovery							
Polycyclic Aromatic Hydrocarbons							
Acenaphthene	%	118			70-130	Pass	
Acenaphthylene	%	116			70-130	Pass	
Anthracene	%	114			70-130	Pass	
Benz(a)anthracene	%	103			70-130	Pass	
Benzo(a)pyrene	%	108			70-130	Pass	
Benzo(b&j)fluoranthene	%	98			70-130	Pass	
Benzo(g.h.i)perylene	%	95			70-130	Pass	
Benzo(k)fluoranthene	%	97			70-130	Pass	
Chrysene	%	113			70-130	Pass	
Dibenz(a.h)anthracene	%	94			70-130	Pass	
Fluoranthene	%	115			70-130	Pass	
Fluorene	%	112			70-130	Pass	
Indeno(1.2.3-cd)pyrene	%	107			70-130	Pass	
Naphthalene	%	112			70-130	Pass	
Phenanthrene	%	120			70-130	Pass	
Pyrene	%	118			70-130	Pass	
LCS - % Recovery							
Heavy Metals							
Arsenic	%	111			70-130	Pass	
Cadmium	%	109			70-130	Pass	
Chromium	%	102			70-130	Pass	
Copper	%	99			70-130	Pass	
Lead	%	100			70-130	Pass	

Test			Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Code
Mercury			%	108			70-130	Pass	
Nickel			%	100			70-130	Pass	
Zinc			%	103			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Spike - % Recovery									
Polycyclic Aromatic Hydrocarbons				Result 1					
Acenaphthene	S20-Jn14984	NCP	%	123			70-130	Pass	
Acenaphthylene	S20-Jn14984	NCP	%	120			70-130	Pass	
Anthracene	S20-Jn14984	NCP	%	102			70-130	Pass	
Fluoranthene	S20-Jn14984	NCP	%	91			70-130	Pass	
Fluorene	S20-Jn14984	NCP	%	112			70-130	Pass	
Naphthalene	S20-Jn14984	NCP	%	120			70-130	Pass	
Phenanthrene	S20-Jn14984	NCP	%	112			70-130	Pass	
Pyrene	S20-Jn14984	NCP	%	93			70-130	Pass	
Spike - % Recovery									
Heavy Metals				Result 1					
Arsenic	S20-Jn14454	NCP	%	112			70-130	Pass	
Cadmium	S20-Jn14454	NCP	%	109			70-130	Pass	
Chromium	S20-Jn14454	NCP	%	103			70-130	Pass	
Copper	S20-Jn14454	NCP	%	99			70-130	Pass	
Lead	S20-Jn14454	NCP	%	99			70-130	Pass	
Mercury	S20-Jn14454	NCP	%	123			70-130	Pass	
Nickel	S20-Jn14454	NCP	%	100			70-130	Pass	
Zinc	S20-Jn14454	NCP	%	78			70-130	Pass	
Test	**Lab Sample ID**	**QA Source**	**Units**	**Result 1**			**Acceptance Limits**	**Pass Limits**	**Qualifying Code**
Duplicate									
Heavy Metals				Result 1	Result 2	RPD			
Arsenic	S20-Jn14037	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Cadmium	S20-Jn14037	NCP	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Chromium	S20-Jn14037	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Copper	S20-Jn14037	NCP	mg/L	< 0.05	< 0.05	<1	30%	Pass	
Lead	S20-Jn14037	NCP	mg/L	< 0.01	< 0.01	<1	30%	Pass	
Mercury	S20-Jn14037	NCP	mg/L	< 0.001	< 0.001	<1	30%	Pass	
Nickel	S20-Jn14037	NCP	mg/L	0.04	0.04	<1	30%	Pass	
Zinc	S20-Jn14037	NCP	mg/L	0.07	0.08	17	30%	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Appropriate sample containers have been used	Yes
Sample containers for volatile analysis received with minimal headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Qualifier Codes/Comments

Code	Description
C01	Leachate Fluid Key: 1 - pH 5.0; 2 - pH 2.9; 3 - pH 9.2; 4 - Reagent (DI) water; 5 - Client sample, 6 - other
N07	Please note:- These two PAH isomers closely co-elute using the most contemporary analytical methods and both the reported concentration (and the TEQ) apply specifically to the total of the two co-eluting PAHs

Authorised By

Ursula Long	Analytical Services Manager
Andrew Sullivan	Senior Analyst-Organic (NSW)
Gabriele Cordero	Senior Analyst-Metal (NSW)

Glenn Jackson
General Manager

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

Measurement uncertainty of test data is available on request or please click here.

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Sample Receipt Advice

Company name: **JBS & G Australia (NSW) P/L**

Contact name: Chris Bielby
Project name: ADDITIONAL PENRITH SOIL
Project ID: 58140
COC number: Not provided
Turn around time: 1 Day
Date/Time received: Jun 10, 2020 6:10 PM
Eurofins reference: **724725**

Sample information

☑ A detailed list of analytes logged into our LIMS, is included in the attached summary table.

☑ Sample Temperature of a random sample selected from the batch as recorded by Eurofins Sample Receipt : 14.2 degrees Celsius.

☑ All samples have been received as described on the above COC.

☑ COC has been completed correctly.

☑ Attempt to chill was evident.

☑ Appropriately preserved sample containers have been used.

☑ All samples were received in good condition.

☑ Samples have been provided with adequate time to commence analysis in accordance with the relevant holding times.

☑ Appropriate sample containers have been used.

☒ Split sample sent to requested external lab.

☒ Some samples have been subcontracted.

N/A Custody Seals intact (if used).

Contact notes

If you have any questions with respect to these samples please contact:

Ursula Long on Phone : or by e.mail: UrsulaLong@eurofins.com

Results will be delivered electronically via e.mail to Chris Bielby - cbielby@jbsg.com.au.

#AU04_Enviro_Sample_NSW

Subject: FW: Eurofins Test Results - Report 723042 : Site PENRITH SOIL (58140)

From: Chris Bielby <CBielby@jbsg.com.au>
Sent: Wednesday, 10 June 2020 6:10 PM
To: Ursula Long <UrsulaLong@eurofins.com>
Subject: FW: Eurofins Test Results - Report 723042 : Site PENRITH SOIL (58140)

EXTERNAL EMAIL*

Hi Ursula,

Could you please schedule TCLP heavy metals and PAHS for SV10 0.1-0.2 on 24 hr turn around please.

Thanks

From: AsimKhan@eurofins.com <AsimKhan@eurofins.com>
Sent: Thursday, 4 June 2020 4:05 PM
To: Chris Bielby <CBielby@jbsg.com.au>
Cc: Milad Noujaim <mnoujaim@jbsg.com.au>
Subject: Eurofins Test Results - Report 723042 : Site PENRITH SOIL (58140)

[EXTERNAL EMAIL] Stop and think before opening attachments, clicking or responding.

Please find attached results for your project in the subject header.

Please note: My office hours are 12 pm to 8 pm.

Kind regards,

Asim Khan
Analytical Services Manager

Eurofins | Environment Testing
Unit F3, Parkview Building
16 Mars Road
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Website : www.eurofins.com.au/environmental-testing

EnviroNote 1098 - Melbourne PFAS Accreditation
EnviroNote 1103 - NATA Accreditation for Dioxins

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Document Status

Rev No.	Author	Reviewer	Approved for Issue		
		Name	Name	Signature	Date
A	Chris Bielby	Matthew Bennett	For Review	For Review	17 September 2020
B	Chris Bielby	Matthew Bennett	For Review	For Review	8 December 2020

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Appendix H Construction Environmental Management Plan

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Penrith City Council

Penrith Central Village Park Remediation Works Construction Environmental Management Plan

Penrith Central Village Park
134-144 Henry St
42-50 Station St and
Allen Place Car Park
PENRITH, NSW

14 December 2020

58140/123808 (Rev A)

JBS&G Australia Pty Ltd

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Penrith City Council

Penrith Central Village Park Remediation Works
Construction Environmental Management Plan

Penrith Central Village Park
134-144 Henry St
42-50 Station St and
Allen Place Car Park
PENRITH, NSW

14 December 2020

58140/123808 (Rev A)

JBS&G Australia Pty Ltd

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Version: 1, Version Date: 14/04/2021

Table of Contents

Abbreviations 1

1. Introduction 2
   - 1.1 Background 2
2. Objectives and Scope of CEMP 9
   - 2.1 Objectives 9
     - 2.1.1 Environmental Aspect Checklist 9
   - 2.2 Referenced Reports 10
   - 2.3 Legislative Framework 10
   - 2.4 Scope 11
3. Site Description 12
   - 3.1 Site Details 12
   - 3.2 Surrounding Land Use 12
   - 3.3 Site History 13
   - 3.4 Existing Environmental Condition 13
     - 3.4.1 Acid Sulfate Soils 13
     - 3.4.2 Groundwater 13
     - 3.4.3 Surface Water 13
     - 3.4.4 Fauna and Flora 14
     - 3.4.5 Meteorology 14
4. Description of Works 15
5. CEMP Responsibilities 16
   - 5.1 Site Owner 16
   - 5.2 Site Environmental Manager – Main Contractor 16
   - 5.3 Competence, Training and Awareness 17
   - 5.4 Contingency and Emergency Response Plans 17
   - 5.5 Monitoring, Inspection and Auditing 18
6. Management of Potential Impacts 19
   - 6.1 Introduction 19
   - 6.2 Frequency of Compliance Checks 20
   - 6.3 Assessment of Risk 20
   - 6.4 Management Measures of potential impacts 21
     - 6.4.1 Soil 21
     - 6.4.2 Air 25
     - 6.4.3 Flora and fauna 28
     - 6.4.4 Groundwater 29

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.4.5 Waste Management 30
6.4.6 Health and Safety 31
6.4.7 Amenity 33
7. CEMP Review 34
8. Limitations 35

List of Tables

Table 2.1: Description of Aspects addressed in this CEMP 9
Table 3.1: Summary Site Details 12
Table 5.1: Emergency Contacts 17
Table 6.1: Risk of Potential Impact Matrix 20

Appendices

Appendix A Environmental Incidents Register
Appendix B Unexpected Finds Protocol
Appendix C CEMP Compliance Audit Checklist

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Abbreviations

Term	Definition
ACM	Asbestos containing material
AF/FA	Asbestos fines / fibrous asbestos
AS	Australian standard
ASS	Acid sulfate soil
bgs	Below ground surface
btoc	Below top of casing
CEMP	Construction environmental management plan
CLM Act	*Contaminated Land Management Act 1997*
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DCP	Development control plan
EPA	NSW Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
ENM	Excavated natural material
IERP	Incident and Emergency Response Procedure
LAA	Licensed asbestos assessor
LCC	Liverpool City Council
LEL	Lower explosive limit
LEP	Local environmental plan
LOR	Laboratory limits of reporting
MAH	Monocyclic aromatic hydrocarbons
NATA	National Association of Testing Authorities
NOHSC	National Occupational Health and Safety Commissions
NSW	New South Wales
OCP	Organochlorine pesticides
OPP	Organophosphate pesticides
PAH	Polycyclic aromatic hydrocarbons
PCB	Polychlorinated biphenyl
PCC	Penrith City Council
POEO Act	*Protection of the Environment Operations Act 1997*
TWA	Time weighted average
SEPP 55	State Environmental Planning Policy (SEPP) 55 'Remediation of Land'
SES	State emergency service
SRZ	Structural root zone
SWA	Safe Work Australia
TDS	Total dissolved solids
TPH	Total petroleum hydrocarbon
TPZ	Tree protection zone
TRH	Total recoverable hydrocarbons
VENM	Virgin excavated natural material
VOC	Volatile organic compounds
WARR Act	*Waste Avoidance and Resource Recovery Act 2001*
WHS	Work Health and Safety

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1. Introduction

JBS&G Australia Pty Ltd (JBS&G) has been engaged by Penrith City Council (the client) to prepare a Construction Environmental Management Plan (CEMP) for the proposed demolition and remediation works to be undertaken with the western portion of the proposed Penrith Central Village Park (City Park). The site location and boundary are presented in **Figure**. The site is legally identified as Lot 1 in DP 164798 and Lot 1 in DP 252457 (134 to 138 Henry Street), Lot 10 and 11 in DP 553665 (140 to 142 Henry Street), Lot 2 in DP 556075 (144 Henry Street), Lot 3 in DP1200790 (42 to 44 Station Street), Lot 1 in DP 526304 (48 to 50 Station Street) and Lot E in DP 163176 (46 Station Street). Notwithstanding the descriptions, portions of the site are also referred to as being present with the former Allen Place Car Park. The site extent if shown as **Figure 2**.

The proposed development will comprise the construction of the Penrith Central Village Park (City Park) which is a large open space / recreational area to be established in the centre of the Penrith central business district. Of note to this plan, demolition works of a range of existing structures will be required prior to site remediation. Areas of soils on the site are further impacted by asbestos and chlorinated ethenes. The extent of chlorinated ethene impacted soils are shown on **Figure 3**. The extent of asbestos impacted soils will be determined following site demolition / pavement removal works. These impacted soils are proposed to be remediated prior to the construction of the Park by excavation, consolidation and encapsulation on-site for long term management. The proposed design of the Park is shown as **Figure 4**, and the area of proposed containment is shown on **Figure 5**.

A pre-Development Application meeting has been held with PCC which amongst a range of documents has identified a requirement for preparation of an Erosion and Sediment Control Plan and a Waste Management Plan. The required elements of these plans, as specific to demolition, remediation and associated construction works, have been incorporated into a CEMP as presented here.

This CEMP has been prepared in response to the pre-DA requirements and in accordance with relevant guidelines made or approved by the NSW EPA.

1.1 Background

The City Park is described as being a significant open space in a prime location on the corner of Henry Street and Station Streets, Penrith. City Park will be a vibrant, thriving, green space with something for everyone and plenty of opportunities to meet, retreat, eat, be active and celebrate together. These aspects are expected to strengthen its appeal as a destination for residents, workers, and visitors and stimulate the day and night time economy.

Key features of the City Park design include a variety of large trees to provide shade, a sensory garden, several water features, as well as natural landscaping to transform the space into an urban retreat. The concept design also provides space for people to meet, eat, be active and celebrate together with these aspects set to stimulate the day and night time economy by attracting residents, visitors and investors.

JBS&G has previously undertaken environmental assessments across the extent of the proposed City Park site for the purposes of determining whether historical commercial, industrial and retail uses had caused environmental impacts to soils and groundwater underlying the site. This has included a significant program of soil, groundwater, soil vapour and indoor air sampling and analysis. The findings of these environmental assessments substantially affect the potential for environmental emissions from the proposed site remediation and associated site construction works and are discussed further following.

Asbestos impacted fill-based soils have previously been identified on the City Park site and are potentially widespread and heterogeneously distributed between the sample locations to date where they have been identified.

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Version: 1, Version Date: 14/04/2021

Chlorinated ethene (CE) impacted soils have been identified underlying 134-138 and 140 Henry Street (**Figure 3**). The occurrence of these contaminants is associated with historical dry cleaning activities as undertaken at 134-138 Henry St. There is a potential of uncontrolled disposal of dry cleaning fluids (which consist of tetrachloroethene) by the former site operator. Tetrachloroethene degrades within the environment to form other chlorinated ethenes including trichloroethene, cis-1,2-dichloroethene and vinvl chloride. Uncontrolled disposal is noted as likely to have included disposal of dry-cleaning fluids either down the sewer or stormwater drains, indicating that chlorinated ethene contaminated soils are more likely in proximity of site services / historical service easements / corridors.

To comply with relevant waste minimisation and ecological sustainable development objectives the contaminated soils will be remediated by on-site encapsulation and long-term management (**Figure 5**). The implementation of these remedial methods will comprise significant storage and handling of contaminated soils which requires to be specifically addressed by the CEMP.

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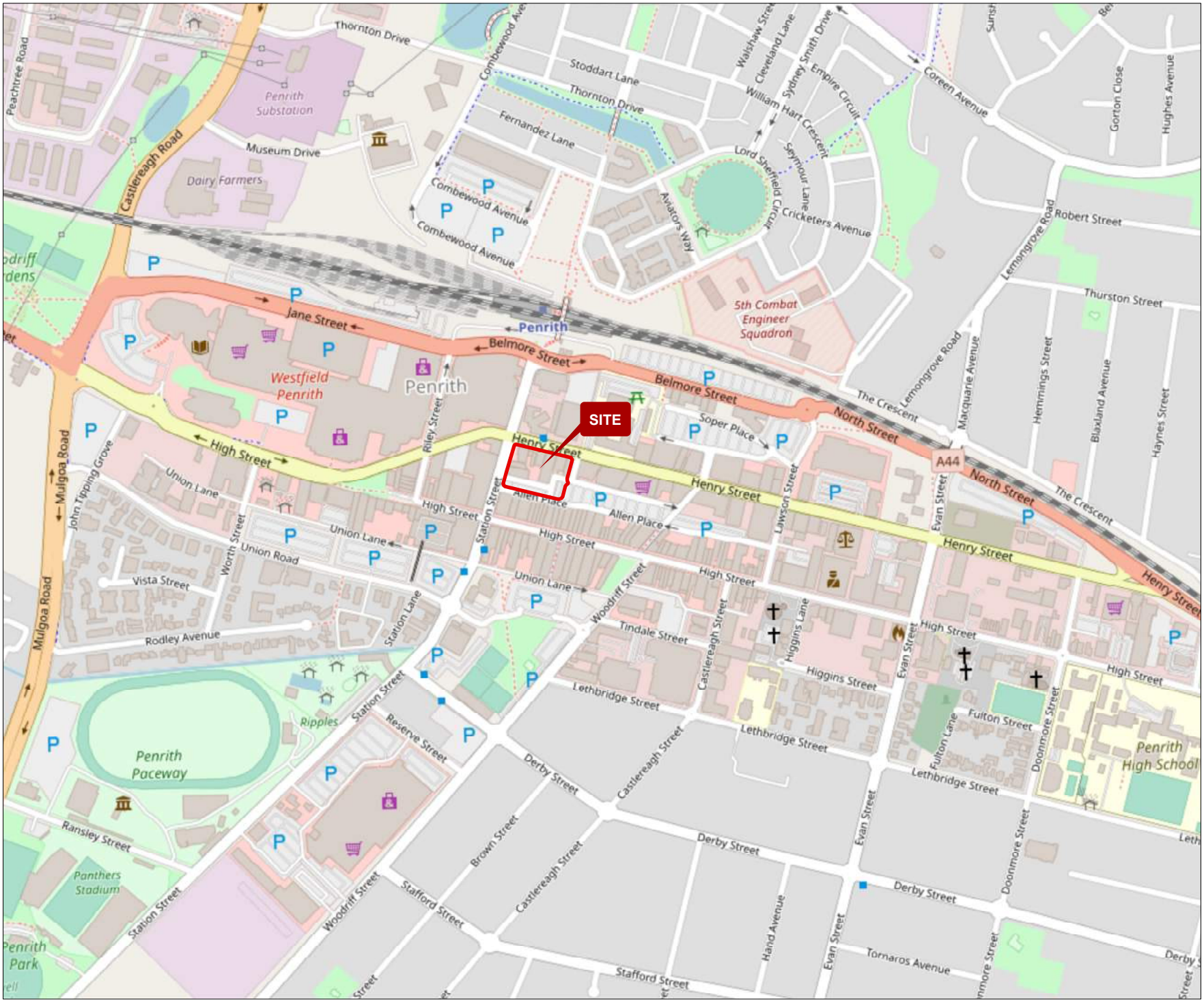

Legend:

Approximate Site Boundary

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R04 Rev A	Date: 03-Dec-2020
Drawn By: RF/RH	Checked By: CB

Scale 1:8,500

0 100 200

metres

Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SITE LOCATION

FIGURE 1

Reference: © OpenStreetMap (and) contributors, CC-BY-SA

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Version: 1, Version Date: 14/04/2021

Legend:

- Project Boundary of Previous Investigations
- Approximate Site Boundary
- Cadastre (NSW LPI, 2019)
- Site Features Polygon
- Sewerage Infrastructure / Preferential Pathway

Areas of Environmental Concern

- AEC 1- Dry Cleaners Location
- AEC 2 - Former Service Station Location
- AEC 4 - Transformer

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R05 Rev 0	Date: 03-Dec-2020
Drawn By: JA/RH	Checked By: CB

Scale 1:600

0 7.5 15

metres

Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SITE LAYOUT

FIGURE 2

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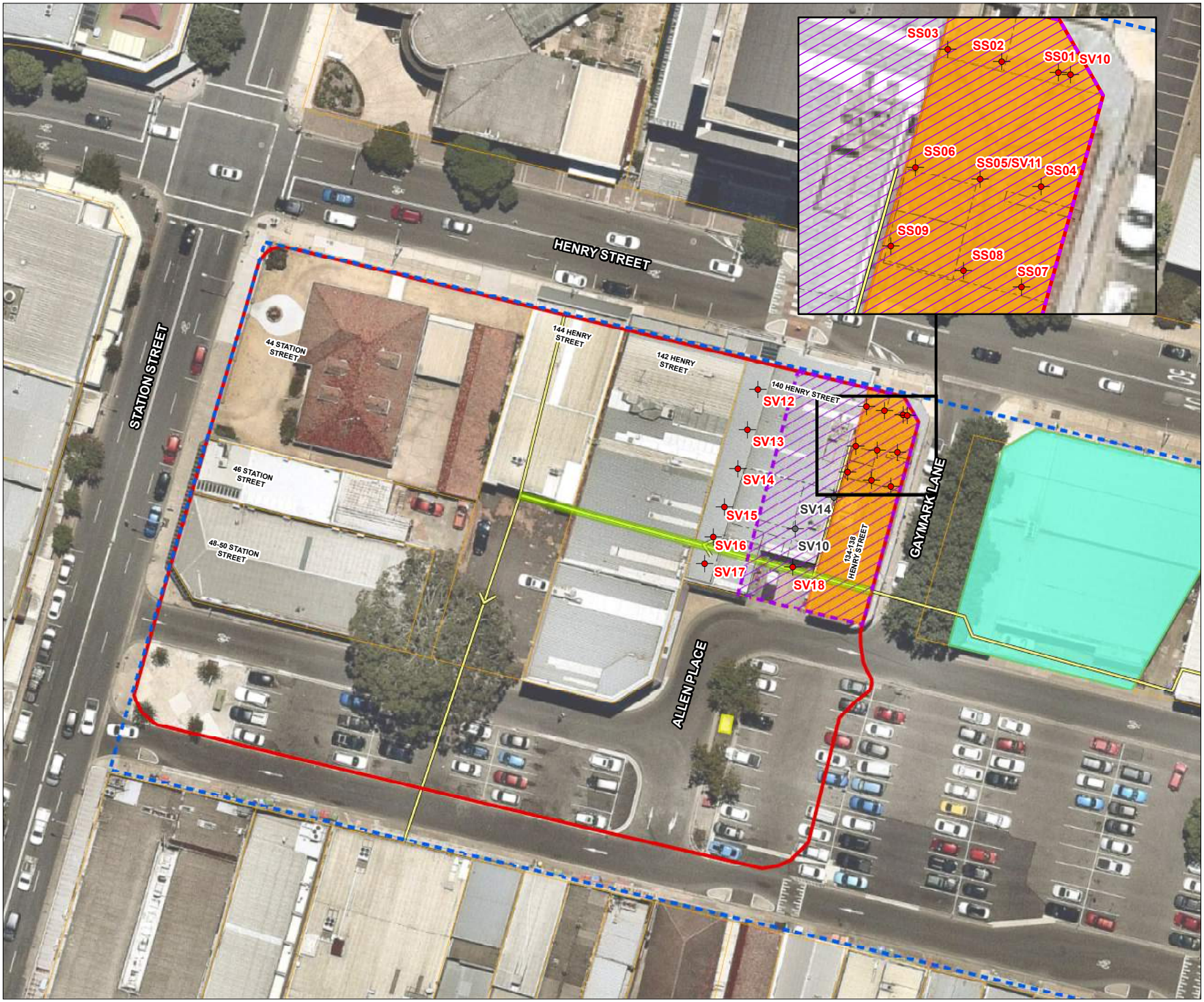

Legend:

- Approximate Site Boundary
- Cadastre (NSW LPI, 2019)

Type

- Inferred Remedial Extent
- Potential Remediation - Sewer Trench
- Project Boundary of Previous Investigations
- Sewerage Infrastructure / Preferential Pathway
- Site Features

Areas of Environmental Concern

- AEC 1- Dry Cleaners Location
- AEC 2- Former Service Station Location
- AEC 4 - Transformer
- Sample Location (JBS&G 2019)
- Sample Location (JBS&G 2020)

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R05 Rev 0	Date: 03-Dec-2020
Drawn By: JA	Checked By: CB

Scale 1:750

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

48-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SAMPLE LOCATIONS AND REMEDIAL EXTENT

FIGURE 3

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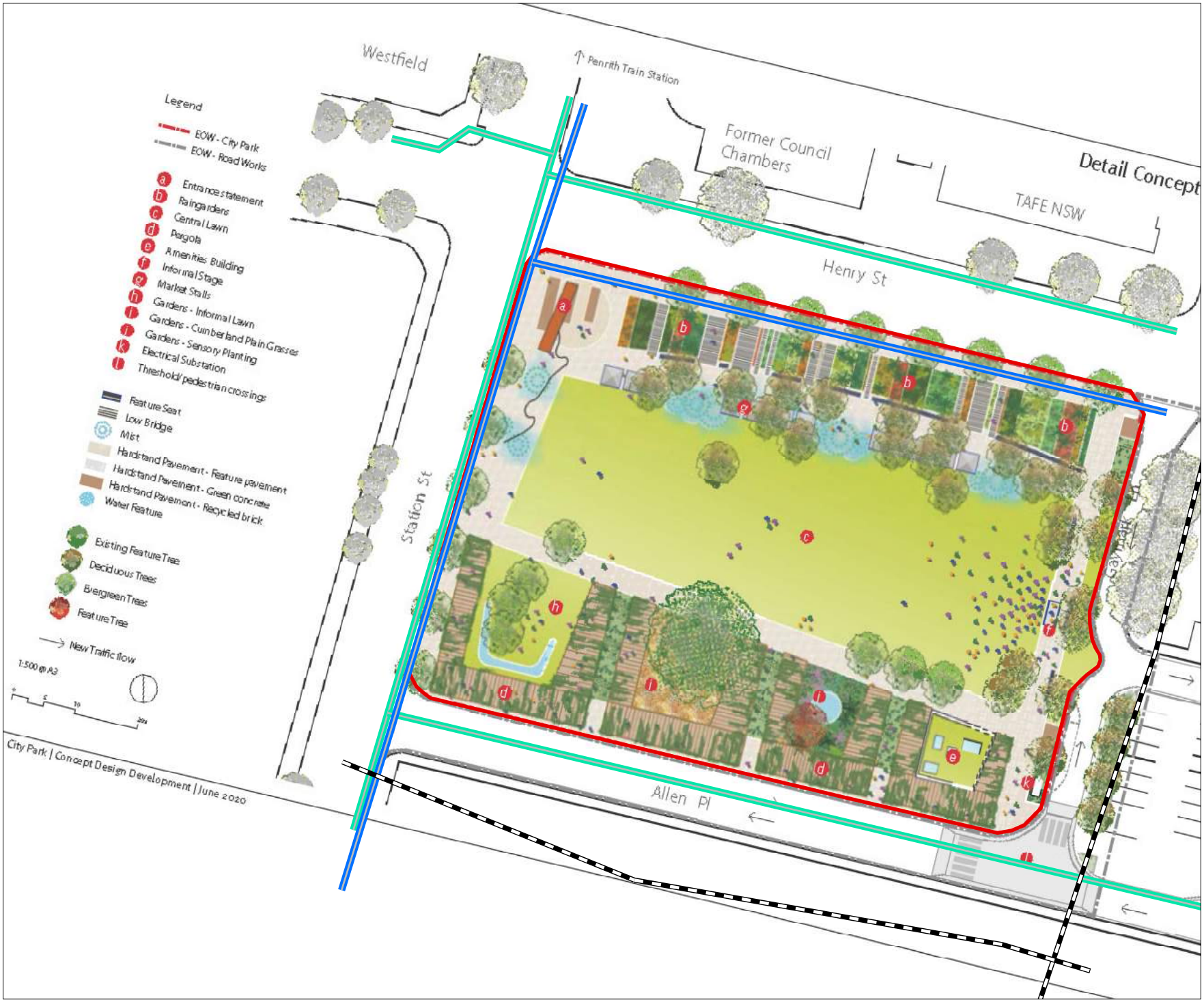

Legend:

Approximate Site Boundary

Proposed Utilities

Gas Main

Sewer

Water Main

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R05 Rev 0	Date: 04-Dec-2020
Drawn By: JA/RH	Checked By: CB

Scale 1:800

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

PROPOSED SITE LAYOUT AND UTILITIES

FIGURE 4

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Legend:

- Approximate Site Boundary

Proposed Utilities

- Gas Main
- Sewer
- Water Main

Suitable Area for Containment Cell

- >30m from Structures, >1m from Utilities

JBS&G

Job No: 58140

Client: Penrith City Council

Version: R05 Rev 0	Date: 04-Dec-2020
Drawn By: JA/RH	Checked By: CB

Scale 1:800

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

42-50 Station Street
134 - 144 Henry Street and
Port Henry Street Carpark,
Penrith, NSW

SUITABLE AREAS FOR CONTAINMENT CELL

FIGURE 5

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2. Objectives and Scope of CEMP

To achieve the objectives outlined in **Section 2.1**, this CEMP will include a description of works, relevant and applicable legislation and regulatory requirements, description of potential impacts of the project and associated management measures.

2.1 Objectives

The objectives of this document are to control potential environmental emissions, from the demolition, remediation and construction works controlled on the site. As per the request from the pre-DA meeting this is required to specifically include consideration of sediment, erosion and waste management.

A description of the environmental management requirements as identified for the project and applicable regulatory guidance are provided in **Sections** Error! Reference source not found. to **2.4** following.

2.1.1 Environmental Aspect Checklist

Table 2.1: Description of Aspects addressed in this CEMP

Aspect	Location in CEMP
Description of works	**Section 4**: Description of works
Details of all contractors involved with the project	**Section 5**: CEMP Responsibilities
Environmental awareness and training of contractors	**Section 5.3**: Competence, Training and Awareness
Compliance with legislation and regulations	**Section 2.3**: Legislative Framework
Measures to prevent noise, water, air and land pollution	**Section 6.4**: Management Measures of Potential Impacts
Safe access to and from the site during construction	**Section 0**: CEMP reference: **12**
Safety and security of work site, road and footpath area	**Section 0**: CEMP reference: **12**
Method of loading and unloading excavation machines, construction materials	**Section 0**: CEMP reference: **12**
Details of management of construction materials and wastes.	**Section 0**: CEMP reference: **10**
Construction vehicle access and egress	**Section0**: CEMP reference: **10**
Erosion and sediment control measures	**Section 6.4.1**: CEMP reference: **1, 3** and **5**
Details of any fuel storage and management	**Section 6.4.1**: CEMP reference: **4**
Detailed erosion and sediment control measures	**Section 6.4.1**: CEMP reference: **3**
Protection of existing trees and vegetation	**Section 6.4.3**: CEMP reference: **8**
Unexpected Finds Protocol	**Appendix A B**
Work, Health & Safety requirements	**Section 0**: CEMP reference: **11, 12, 13, 14** and **15.**
Contingency and emergency response plans	**Section 5.4**: Contingency and Emergency Response Plans

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Version: 1, Version Date: 14/04/2021

2.2 Referenced Reports

The following studies have been referenced within this CEMP:

- *Penrith City Council Penrith Central Park Village Overarching Remedial Action Plan 114 to 146 Henry Street, 42 to 50 Station Street and Allen Place Car Park rev 0*, 5 March 2019, JBS&G Australia Pty Ltd (JBS&G 2019);
- *Penrith City Council Penrith Central Park Village DRAFT Pre-Remediation Investigation 134 to 144 Henry Street, 42 to 50 Station Street, and Allen Place Car Park rev A*, 17 September 2020, JBS&G Australia Pty Ltd (JBS&G 2020a);
- *Penrith City Council Penrith Central Park Village DRAFT Remedial Work Plan 134 to 144 Henry Street, 42 to 50 Station Street, and Allen Place Car Park rev B*, 8 December 2020, JBS&G Australia Pty Ltd (JBS&G 2020b); and
- *Penrith City Council DRAFT Long Term Environmental Management Plan Penrith Central Village Park 134-144 Henry St, 42-50 Station St and Allen Place Car Park PENRITH, NSW rev A*, 4 December 2020, JBS&G Australia Pty Ltd (JBS&G 2020c).

2.3 Legislative Framework

The key relevant acts, regulations and guidelines are listed below with a summary of their applicability. The site owner and contractors are required to satisfy themselves that all applicable permits and licences have been obtained and their conditions satisfied.

Work Health and Safety Act 2011 (WHS Act 2011)

- The overarching Act for NSW setting law relating to employee health and safety and employer responsibilities.

Work Health and Safety Regulation, 2017 (WHS Regulation, 2017)

- Sets Regulations and details the duties for employers to achieve required employee health and safety performance with reference to the management and working with asbestos. The WHS Regulation 2017 also contains requirements for maintenance of asbestos registers.

Protection of the Environment Operations Act 1997 (POEO Act 1997)

- The POEO Act enables the Government to set out explicit protection of the environment policies (PEPs) and adopt more innovative approaches to reducing pollution. Includes regulation of waste activities including appropriate assessment, classification and disposal of waste including waste soil.

***Contaminated Land Management Act 1997* (CLM Act 1997)**

- The CLM Act controls the assessment of contamination and management of contaminated soils and groundwater. The Act also provides guidance for the determination of whether a site is considered significantly contaminated land, and allows for accreditation of Site Auditors.

Environmental Planning and Assessment Act 1979 (EP&A Act 1979)

- The EP&A Act allows plans to be made (environmental planning) to guide the process of development including development on potentially contaminated land. Linked to State Environmental Planning Policy (SEPP) 55 'Remediation of Land' relating to making planning decisions regarding contaminated and potentially contaminated land.

State Environmental Planning Policy (SEPP) 55 'Remediation of Land'

- SEPP 55 relates to the decision-making process in undertaking remediation of land and making planning decisions regarding contaminated and potentially contaminated land.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Waste Avoidance and Resource Recovery Act 2001 (WARR Act)

- The WARR Act replaced the Waste Minimisation and Management Act 1995 and controls waste generation and reduction.

Penrith Development Control Plan 2014

- The Penrith Development Control Plan (PDCP, 2014) provides objectives and development controls that establish clear guidelines for development and protection of the environment which include:
    a. Protection of vegetation within riparian corridors;
    b. Protection of vegetation in developable areas;
    c. Water cycle management; and
    d. Contamination.

Penrith Local Environmental Plan 2010

- The proposed development at the site is identified to be under the Penrith Local Environmental Plan (PLEP, 2010) and must meet all requirements described within.

2.4 Scope

In order to achieve the objectives stated in **Section 2.1** above, the preparation of the CEMP involved the following tasks:

- Review of the project outline as per PCC media releases and concept plans as well as a review of the environmental setting against proposed land use, including consideration of the regional hydrology, hydrogeology, geology, climate and soils;
- Review of available reports relating to contamination assessment, remediation and validation, including the JBS&G (2019, 2020a, 2020b and 2020c) reports;
- Review the NSW DPI (2004*). Guidelines for the Preparation for Environmental Management Plans* as well as other site-specific management plans;
- Review of and surrounding land uses based on satellite images and other online resources;
- Review of the Client's concept plan and likely extent of facilitating works (**Figure 4**); and
- Development of mitigation measures based on current site environmental conditions current development scope, compliance obligations and effectiveness in controlling potential unexpected contamination finds.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3. Site Description

3.1 Site Details

Detailed information of the site condition, physical characteristics, history and surrounding land uses provided in the following sections are summarised from previous site reports. A list of site reference reports is provided in **Section 0.**

The site is located between Henry and Station Sts in Penrith, further incorporating the Allen Place Car Park. The site location is shown on **Figure 1** and the site extent is shown on **Figure 2**. Site details are summarised in **Table 3.1** below.

Table 3.1: Summary Site Details

Property Identification and Street Addresses	The site is comprised of the following legal properties: • Lot 1 in DP 164798 and Lot 1 in DP 252457 – 134 to 138 Henry Street • Lot 10 and 11 in DP 553665 – 140 to 142 Henry Street • Lot 2 in DP 556075 – 144 Henry Street • Lot 3 in DP1200790 – 42 to 44 Station Street • Lot 1 in DP 526304 – 48 to 50 Station Street • Lot E in DP 163176 – 46 Station Street In addition, the site area includes portions of the Allen Place Car Park.
Local Government Authority	Penrith City Council
Approximate MGA Coordinates (MGA 56)	Easting: 286582.2 Northing: 6262912.7
Site Zoning	Commercial Core (B3) and Public Recreation (RE1) under Penrith Local Environmental Plan (LEP) 2010
Current Use	Commercial (car parking, retail and services)
Previous Use	Commercial/industrial (car parking, dry cleaning and general retail/services) and residential
Proposed Use	Public open space
Site Area	Approximately 0.71 ha

3.2 Surrounding Land Use

The land uses of adjacent properties or properties across adjacent roads at the time of inspection are summarised below.

- North – The site is bound to the north by Henry Street and then numerous commercial premises including UFC Gym, Queens of Hearts Community Foundation and Nepean College. Further north is an open carpark and commercial premises on Belmore Street, including Bob Jane T-Marts and a veterinary hospital;
- East – To the east of the subject site is the remaining City Park area comprising Gaymark Lane and commercial properties beyond. It is noted that a former service station is located directly east of Gaymark Lane in which the RAP (JBS&G 2019a) identifies that as an area of environmental concern (AEC, shown on **Figure 3**). However assessments have not identified any evidence of significant contamination entering the site as attributable to this source;
- South – The site is was bound to the south by Allen Place, following which are multiple commercial properties including cafes, a medical centre and pharmacy. Beyond High Street commercial premises are present; and
- West – The site is bound to the west by Station Street, then medium to high density commercial premises. Further to the west is Peach Tree Creek and eventually the Nepean River.

Based on a review of the existing surrounding land uses, the potential for the migration of contamination from off-site sources onto the site is considered to be low. It is noted that the site has been subject to filling to form the current surface conditions and elevations.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.3 Site History

A detailed site history assessment has been provided in earlier JBS&G assessments. Aspects of the site history as relevant to the occurrence of contamination within the extent of the site are briefly discussed following.

A former dry cleaner comprised the northern third of the building (referred to as Shop 3, Gaymark Lane) located at 134-138 Henry Street, Penrith. The shop-front occupied most of the building footprint (>85 %), with the remainder comprising a secluded water closet, storage space and point of sale. The premise was vacant during the period of the investigation. Uncontrolled releases of dry cleaning fluids are anticipated to have occurred from this business which has led to chlorinated ethene contaminated soils in proximity of this area of the site.

Fill based soils have historically been used across the site during previous development phases. Asbestos impact has been identified as associated with the fill based soils and is likely to be distributed on a heterogenous basis through the remaining fill materials on the site.

3.4 Existing Environmental Condition

As described in **Section 1.1** the site had been subject to environmental contamination of soils, predominantly by chlorinated ethenes and asbestos. These impacts will be remediated by the proposed demolition and remedial works to be undertaken with the site development.

3.4.1 Acid Sulfate Soils

No acid sulfate soils were identified during previous investigations or are expected to be present on the site.

3.4.2 Groundwater

Registered groundwater bore information was obtained from the NSW Department of Primary Industries groundwater mapping tools, NSW DPI (2016[1]). A review of the registered bore information indicated that there were thirteen bores within a 1.5 km radius of the Site. Based on the reported geology, topography and depth to groundwater, groundwater migration is expected to occur in a north-westerly direction, towards Peach Tree Creek approximately 1.2 km away. Groundwater has been reported in the surrounding properties within the river gravels layer. Previous JBS&G investigations reported groundwater depths ranging from 6.96 m to 8.05 m below ground surface (bgs), flowing in a north-westerly direction.

Registered groundwater bores located within a 1.5 km radius of the site are used for monitoring, recreational and testing purposes. Given the relatively dense urban use of the site and surrounding properties, in addition to the identified licensed bores, there is a moderate probability of additional undocumented bores near the site. No reported utilisation of groundwater as a drinking water source has been reported.

3.4.3 Surface Water

Rainfall is considered likely to migrate primarily through surface water runoff into the municipal stormwater system. Minor infiltration into the underlying porous soils and surface is also expected in areas of unsealed ground.

The site is largely covered by concrete (pre development), asphaltic pavements and building footprints. As such, surface water generated during periods of rainfall is anticipated to primarily enter the municipal stormwater system; via discharge into onsite stormwater catchment infrastructure or alternatively discharge into stormwater pits within the surrounding roadways.

[1] NSW Department of Primary Industries, 2015. Groundwater Monitoring Overview Map. Http://allwaterdata.water.nsw.gov.au/water.stm. Accessed 8 November 2016.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Increased infiltration of surface water will occur following demolition works and during construction of the Park, and with the redeveloped Park form (**Figure 4**) excluding the area of long term containment.

The nearest water body to the Site is Peach Tree Creek, approximately 1.1 km to the west of the site boundary. Peach Tree Creek ultimately discharges to the Nepean River. Municipal stormwater discharges to the Nepean River.

3.4.4 Fauna and Flora

The site is located within the central business district of Penrith. With this, there is limited opportunity for flora and fauna to establish on the site. Migratory bird species and small areas of vegetation have been observed. A significant existing large Eucalypt tree is present in the southern portion of the site and will be retained with the City Park development (subject to potential site remediation constraints). Significant landscaping / vegetation is proposed with the site development which will substantially alter the flora characteristics of the site.

3.4.5 Meteorology

A review of average climatic data for the nearest Bureau of Meteorology monitoring location (Penrith Lakes[2]) indicates the site is located within the following meteorological setting:

- Average minimum temperatures vary from 5.5 ^{o}C in July to 18.5 ^{o}C in January;
- Average maximum temperatures vary from 17.7 ^{o}C in July to 30.7 ^{o}C in January;
- The average annual rainfall is approximately 728.1 mm with rainfall greater than 1 mm occurring on an average of 71.7 days per year; and
- Monthly rainfall varies from 30.6 mm in September to 121.4 mm in June with the wettest periods occurring on average in January to June.

[2] http://www.bom.gov.au/climate/averages/tables/cw_067113.shtml, Commonwealth of Australia, 2013 Bureau of Meteorology, Product IDCJCM0028 prepared on 1 November 2016 and accessed by JBS&G on 8 November 2016.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4. Description of Works

A brief outline of the anticipated works to be undertaken on the site is provided following:

- Provision of security fencing at the extent of site and establishment of site facilities / offices;
- Establishment of vehicle exit / entry points to be utilised during construction works;
- Existing trees as to be retained within the site shall be identified and provided with tree protection measures;
- Site services shall be isolated;
- Initial asbestos removal works will be undertaken at existing site structures as informed by the extent of asbestos building materials used and reported in a hazardous materials building survey as previously prepared for the works;
- Removal of minor quantities of other hazardous materials present as identified in the hazardous materials survey;
- Demolition of above ground structures, segregation of materials as per recycling opportunity and removal of demolished materials for recycling / disposal;
- Removal of site pavements in other site areas to allow exposure / observation of site soils;
- Detailed assessment of site soils to determine the extent of fill materials affected by asbestos containing materials (ACM);
- Removal of existing site services (i.e. sewer, stormwater, other conduits etc) and assessment of service corridors for potential presence of chlorinated ethenes / preferential pathways of chlorinated ethene migration;
- Identification of the extent of ACM and chlorinated ethene impacted soils by lateral and vertical dimensions;
- Excavation and segregated stockpiling of the lateral and vertical extent of contaminated soils in a controlled location on the site;
- Completion of an excavation at the central portion of the (area of the site as nominated in JBS&G 2020b and shown on **Figure 5**) to a sufficient vertical extent to contain the extent of contaminated soils below a depth of at least 1 m. Stockpiling of surplus soils from excavation in a segregated clean stockpile location;
- Completion of area of site containment inclusive of geosynthetic clay liner over the extent of retained soils, placement of a marker layer, and re-use of soils as available from the 'clean stockpile' to place a 1 m thick capping layer over the extent of the containment;
- Use of remaining clean stockpile to re-instate excavations as placed for the excavation / removal of contaminated soils; and
- Preparation of site as City Park by services installation and soft and hard landscaping as consistent with the approved City Park plans.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5. CEMP Responsibilities

5.1 Site Owner

It is the responsibility of the Site Owner (Penrith City Council), to ensure an appropriately trained Site Environmental Manager is appointed by the Main Contractor (to be nominated) to undertake the responsibilities set out in **Section 5.2** below.

5.2 Site Environmental Manager – Main Contractor

Works are required to be undertaken which will involve handling of contaminated material. An appropriately trained Site Environmental Manager shall be appointed by the Main Contractor (to be nominated) whom shall be responsible for the following:

- A person in a senior management position in the Main Contractor's organisation (to be nominated) is appointed as the Site Environmental Manager, and given the responsibility for ensuring the CEMP is provided to relevant staff and other stakeholders and implemented appropriately;
- The Site Environmental Manager should be supported by the Main Contractor's Health Safety and Environment (HSE) team;
- The CEMP is reviewed and updated regularly by an appropriately qualified and experienced person to ensure it complies with updates to regulatory requirements and its relevance to site conditions following additional works which may be undertaken at the site;
- A copy of the CEMP should be provided to Council and the Auditor for review and comment, should future updates to the CEMP be undertaken;
- Site personnel or contractors that must conduct intrusive works at the site are inducted into this CEMP and made aware of their responsibilities regarding health and safety and also protection of the environment;
- All site personnel and contractors are made aware of existing contamination and a copy of this CEMP is supplied to anyone conducting intrusive works across the site;
- The health, safety and environmental requirements specific to the contamination issues on the site, as outlined in this CEMP, are complied with;
- Environmental incidents are reported in a timely manner to the appropriate statutory authorities, as necessary in accordance with legislation;
- Management of all operations, employees and subcontractors as relevant to the requirements of this CEMP;
- Ensuring compliance with all environmental requirements outlined in this CEMP and statutory requirements through the engagement of an environmental consultant to conduct external CEMP compliance audits according to the checklist provided as **Appendix C**;
- Liaison with the regulatory authorities in relation to environmental matters;
- Co-ordination of, where necessary, environmental monitoring, data assessment and reporting;
- Where necessary, reviewing environmental reports and inspections and initiating any actions to rectify;
- Participation in environmental incident investigations;
- Participation in environmental meetings and programs;

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Oversight of the implementation of environmental management measures at the site; and
- Liaison with the community of the area to address any questions regarding the management areas or this CEMP.

5.3 Competence, Training and Awareness

It is the responsibility of the Site Environmental Manager working on the site to ensure that:

- A person in charge of site works (e.g. Site Foreman, Project Manager, Site Supervisor, or similar) is appointed, for the purposes of implementing the measures outlined within this CEMP, and are to be responsible for ensuring successful implementation of this CEMP including appropriate communication with the Site Owner and/or Site Environmental Manager as required;
- Works are conducted in compliance with the CEMP requirements, in addition to any other specific requirements for the tasks undertaken;
- Notify the Site Owner of any unexpected finds encountered during works;
- Any works with asbestos (when encountered) should give appropriate consideration to requirements of Safe Work Australia, Work Safe NSW and other relevant guidelines, codes of practice and standards; and
- Any works involving hazardous materials, contaminated and waste material should be completed in accordance with relevant legislation, guidelines and standards.

It is the responsibility of the Main Contractor (to be nominated) to:

- Ensure all staff working on the site are provided with the environmental training required to competently carry out their work;
- Ensure all site staff and contractors are inducted before commencing work in the Site Office by the Site Manager or other relevant personnel; and
- Maintain Training / Induction Register in the Site Office.

5.4 Contingency and Emergency Response Plans

It is the responsibility of the Main Contractor (to be nominated) to ensure that:

- Induction for all staff and subcontractors working on the site includes training on the potential environmental emergencies, relevant environmental safeguards and risk mitigation measures.
- An Incident and Emergency Response Procedure (IERP) will be established prior to commencement of work and communicated to all site personnel and followed for the duration of the works; and,
- Contact details for site emergency response personnel on site are detailed in **Table 5.1.**

Table 5.1: Emergency Contacts

Emergency Contact	Contact number
Penrith City Council	02 4732 7777
Emergency Services (Police, Fire, Hazmat, Ambulance)	000/112
Penrith Medial Centre (61-79 Henry St Penrith)	02 4721 8755
Nepean Hospital (Derby St Kingswood)	02 4734 2000
SES	132 500
Work Safe NSW	9370 5877
EPA Pollution	131 555
Site Environment Manager	To be confirmed
Site Manager	To be confirmed

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5.5 Monitoring, Inspection and Auditing

It is the responsibility of the Site Environmental Manager to ensure that:

- Environmental monitoring as required by the CEMP is undertaken in accordance with the requirements of the CEMP and by a person appropriately qualified and experienced to undertake the specific monitoring. Environmental monitoring reports are made available and reviewed to ensure compliance with relevant environmental criteria established for the project;
- Any exceedances of environmental monitoring criteria are assessed and rectified to eliminate / mitigate the potential for future exceedances;
- Environmental inspections are undertaken weekly by an appropriately qualified and competent person and appropriately documented in an Environmental Inspection Report, and that additional erosion and sediment control inspections are conducted after more than 10 mm of rain in a 24-hr period;
- A visual inspection and validation sampling are undertaken by a suitably qualified Environmental Consultant after the completion of bulk earthworks, the removal of each stockpile and after the completion of construction works, in order to ensure works do not result in the spread of contamination and that all contaminated material is removed;
- Copies of Environmental Inspection Reports prepared by an appropriately qualified and competent person, as kept with development project records; and
- A compliance audit (**Appendix C)** is undertaken at monthly intervals when activities are taking place during the site preparation works, construction works and also at the completion of construction. It is recommended that a compliance audit should be undertaken a year after the completion of site development, and then at a time interval deemed appropriate and effective by the Site Owner.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6. Management of Potential Impacts

6.1 Introduction

Management measures for the construction of the site are described in **Section 6.4** below. This table forms the management framework of this CEMP and should be referred to and implemented by the responsible person in the allocated timeframes to minimise the impacts as result of the site activities.

Based on the Description of Works in **Section 4** above, the site preparation works phase is likely to have the highest environmental risks associated with it, as described in **Section** Error! Reference source not found. above. The activities of key concern are likely to be the handling, movement, disposal of excavated materials, and importation of fill material and the associated dust, erosion and sedimentation impacts.

Intrusive works for site remediation and future service installation will not intercept groundwater based on reported depths (JBS&G 2019 and 2020b). Noise impacts are likely to be associated with all phases of the project. All construction activities associated with the development are considered to result in a degree of environmental impact and should be managed according to the management measures outlined under the relevant aspect.

Management measures for the following aspects are included in the table below:

- **Section 6.4.1 Soil:**
    a. Contaminated soils (chlorinated ethene and asbestos contamination);
    b. Imported soils;
    c. Erosion and sediment control; and
    d. Contamination of soils (by the works).
- **Section 0 Air:**
    a. Air quality – asbestos and chlorinated ethene vapours; and
    b. Dust, odour and air quality.
- **Section 6.4.3 Flora and fauna**
- **Section 6.4.4 Groundwater**
- **Section 0 Waste management** (inclusive of Waste Management Plan)
- **Section 0 Health and safety:**
    a. Fire;
    b. Safe access and security of the site during works;
    c. Contaminated material handling;
    d. Unexpected finds; and
    e. Noise.
- **Section 6.4.7 Amenity**
    a. Noise.

The CEMP Compliance Audit Checklist is provided as **Appendix C** and should be completed by an appropriately qualified Environmental Consultant to ensure that the management objectives

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

outlined below are being met and if not, additional measures are implemented in order to meet the desired outcome.

6.2 Frequency of Compliance Checks

It is recommended that these audits be completed at monthly intervals when activities are taking place during the site preparation works, demolition, remediation and associated construction works and also at the completion of construction. It is recommended that a compliance audit should be undertaken a year after the completion of site development, and then at a time interval deemed appropriate and effective by the Site Owner. Each aspect and potential impact associated with the description of works is provided with a corresponding reference number to be utilised during subsequent site CEMP compliance audits.

6.3 Assessment of Risk

Potential environmental risks have been identified through assessment of the existing environmental condition of the site against the amount of change the development will generate. The risk of each potential impact was assessed according to the risk matrix in **Table 6.1** below.

Table 6.1: Risk of Potential Impact Matrix

RISK MATRIX		Severity of Consequence				
		Severe	Significant	Moderate	Minor	Negligible
Likelihood	Very Likely	Very High	High	Medium - High	Medium	Low - Medium
	Likely	High	Medium - High	Medium - High	Low - Medium	Low
	Possible	Medium - High	Medium - High	Medium	Low - Medium	Low
	Unlikely	Medium	Medium	Low - Medium	Low	Low
	Very Unlikely	Medium	Low - Medium	Low	Low	Low

The risk levels identified for each potential impact below were identified through consideration of the likelihood and the corresponding severity of the impact. The management measures provide controls to mitigate the risk associated with the activities associated with the described development of the site.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.4 Management Measures of potential impacts

6.4.1 Soil

Aspect	Reference	Responsible Person	Potential Impact	Cause	Risk	Management Objective
Contaminated soils	**1**	Site Environmental Manager	Cross contamination of clean soil as result of stockpiling of contaminated excavated material.	Inadequate isolation of soils and inadequate erosion controls.	**Medium - high**	Contaminated material stockpile area is validated clean after use and minimal runoff and erosion occurring onsite.

Management Measures

- Ensure stockpiles are placed on flat ground.
- Limit the ground area to be disturbed by stockpiling material by implementing a system of staged excavation, stockpiling, classification, removal and validation to one bench area at a time.
- Stockpiles to be covered with a water proof material (i.e. HDPE plastic) and weighed down barrier when remaining for more than 7 days.
- Replace a protective barrier between ground surface and impacted stockpile between each stockpiling event.
- When stockpile is uncovered, the stockpile is to remain damp during excavation works as required. Care should be taken to ensure that runoff is not generated during wetting down events.
- Establish silt fence enclosures around stockpiles as required.
- Securely stockpiled separately and inspected for signs of contamination.
- Inspected and sampled by an appropriately qualified person when stockpile footprints cover an unsealed surface.
- Undertake classification of excavated soils in NSW EPA Waste Classification Guidelines Part 1: Classifying Waste, and relevant waste regulations where any soils become surplus to site requirements.
- Immediately notify Site Environmental Manager (SEM) of any suspected or potentially contaminated ground exposed during construction activities outside of extent of environmental consultant advised extent of chlorinated ethene and asbestos contaminated soils. All work must cease within the vicinity of the actual or suspected contaminated land and the area fenced off.
- If contaminated ground is discovered, divert surface runoff away from the contaminated area.
- Surface runoff water contaminated by exposure to the contaminated ground must be contained and treated prior to discharge.
- Where asbestos is encountered, appropriate consideration of requirements of Safe Work Australia, Work Safe NSW and other relevant guidelines, codes of practice and standards will be required. Reference shall be made to the Asbestos Management Plan for specific asbestos requirements.
- Implement the Unexpected Finds Protocol at **Appendix B** if hazards arise from unexpected sources and/or in unexpected locations.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Aspect	Reference	Responsible Person	Potential Impact	Cause	Risk	Management Objective
Imported soils	**2**	Environmental Manager, Site Supervisor	Importation of contaminated/impacted fill or reuse of contaminated soil.	Improper classification of imported fill or excavated material	**Medium**	No contaminated material entering the site or reuse of contaminated soil onsite.
Management Measure						
• Any existing soils excavated to be reused on the site must be analysed and classified by an appropriately qualified and experienced environmental consultant, in accordance with relevant NSW EPA endorsed guidelines including the "Waste Classification Guidelines" 2014, prior to reuse/disposal. • Any fill material that is imported onto the site must comprise Virgin Excavated Natural Material (VENM), Excavated Natural Material (ENM) or other suitable material in accordance with the relevant Resource Recovery Exemption issued under the Protection of the Environment Operations (Waste) Regulation 2014. • No recycled or other material containing asbestos shall be imported to the site.					

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Aspect	Reference	Responsible Person	Potential Impact	Cause	Risk	Management Objective
Erosion and Sediment control	**3**	Site Environmental Manager	Erosion of material into surface water, surrounding roads	Inappropriate erosion protection, traffic and plant management	**Medium - high**	No stockpile material entering surface water bodies.

Management Measures

- Appropriate sediment and erosion controls must be implemented and maintained for the duration of soil management works, consistent with the Penrith City Council Engineering Specification for Civil Works (2017).
- Place temporary stockpiles away from stormwater drains and drainage lines.
- Ensure stockpiles are placed on flat ground.
- Limit the height and size of stockpiles to a maximum 2:1 height to width ratio, and no higher than 2 m for topsoil and 3 m for subsoil / contaminated soils.
- Stockpiles to be covered with a water proof material (i.e. HDPE plastic) and weighed down barrier when remaining for more than 7 days.
- When stockpile is uncovered, the stockpile is to remain damp during excavation works as required. Care should be taken to ensure that runoff is not generated during wetting down events.
- Establish silt fence enclosures around stockpiles as required.
- Silt fences are to be installed around the entire boundary of the site.
- Stockpiles should be constructed with water diversion features upslope, and/or construction of earth banks to divert water around stockpiles.
- Remove excavated materials offsite as soon as practicable to minimise risk of run-off into adjacent areas.
- Ensure that all on-site stormwater management infrastructure is operational and appropriately designed to handle stormwater generated on the site.
- The Site Environmental Manager must inspect the stormwater and drainage measures on a weekly basis and after any rain event. Records of observations during these inspections should be kept in the site register.
- All vehicles exiting the site will pass through a wheel wash minimise tracking of dirt and potentially contaminated soil or sediment to enter onto local roads.
- Specify a “dirty zone” and ensure no decontaminated equipment be contaminated before leaving site.
- Surface water runoff from outside the “dirty zone” will be stored on site for reuse.
- The wash down area should have appropriate sediment controls around it and be large enough to hold all waste water generated.
- The washdown area should be clearly signposted to alert subcontractors and staff of their responsibilities.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Aspect	Reference	Responsible Person	Potential Impact	Cause	Risk	Management Objective
Contamination of soils	**4**	Environmental Manager, Site supervisor, Site personnel	Contamination of soil and / or water from fuel spills.	Improper containment of fuel sources or damaged machinery / equipment.	**Medium - High**	Eliminate soil or water contamination onsite due to oil or fuel spills.

Management Measures

- Site staff are to be made aware of the extent of chlorinated ethene and asbestos contaminated soils present across the site.
- Site staff are to be made aware of a segregated stockpile location of chlorinated ethene and asbestos contaminated soils that is proposed to be retained on site.
- The extent of the chlorinated ethene and asbestos contaminated soils is to be minimised , subject to stockpile dimension requirements, to mitigate the potential for soils impact.
- The upper 100 mm of soils present underlying the chlorinated ethene and asbestos contaminated soils stockpile shall be included with the stockpiled soils when transferred for on-site containment as per the preferred remedial approach. These soils shall be assumed to have been caused to be contaminated by the stockpiling of contaminated soils overlying.
- Ensure all staff are aware of the Site Emergency Plan and the Spill Management Procedures during the Site-Specific Induction.
- Spill kits will be kept onsite and all site personnel trained to use them. If a spill to water occurs, the Site Environmental Manager is to be notified immediately to implement corrective actions.
- A record of any spill event is to be kept and actioned as soon as possible.
- No chemicals, fuels or wastes will be stored within 50 m of any natural or stormwater drainage lines or on foreshore. All such substances must be contained in sealed vessels of appropriate volumes and stored in bunded areas.
- Ensure all chemicals are stored in accordance with the manufacturer's instructions and the Material Safety Data Sheet (MSDS).
- Machinery and equipment to be inspected and maintained off-site where possible.
- Daily pre-start checks to be undertaken for all onsite plant and equipment.
- Refuelling of equipment, oil changes, wash down and degreasing of machinery shall occur on hardstand, appropriately bunded and contained areas equipped with a spill kit (appropriate to diesel spills).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.4.2 Air

Aspect	Reference	Responsible Person	Potential Impact	Cause	Risk	Management Objective
Air Quality - Asbestos	**5**	Site Environmental Manager, Site Supervisor	Exposure to site workers and / or surrounding residents to Asbestos Containing Material (ACM)	Unexpected discovery of ACM.	**Medium**	Minimise as far as possible the ACM exposure to site personal and surrounding residents as practicable.

Management Measures

During any fill/soil excavation in areas where asbestos has been or is identified, demolition / removal of asbestos containing materials from site structures, transport or placement works on site involving (>10 m^2) bonded ACM and/or friable ACM:

- Airborne asbestos fibre monitoring will be undertaken using calibrated portable air sampling pumps;
- Air monitoring should be undertaken by a competent person, as defined in WHS Regulation (2011) or a licensed asbestos assessor, for works involving non-friable asbestos. For works involving friable asbestos, air monitoring must be undertaken by a WorkCover Licensed Asbestos Assessor (LAA);
- Monitoring locations shall be determined by the competent person or LAA, but shall include at least four locations surrounding the daily specific work area. At the end of each monitoring period the pump and attached filter will be collected and analysed at a National Association of Testing Authorities (NATA) accredited laboratory;
- Monitoring works shall be conducted in accordance with the National Occupational Health and Safety Commissions' Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition (NOHSC:3003 (2005)) and the procedures and results shall be NATA accredited;
- The following action levels will be applied upon receipt of daily results, as outlined in the Safe Work Australia (2016) (SWA):
  - Reading of less than 0.01 fibres/mL – control measures in place are working effectively, site works to continue;
  - Reading between 0.01 and 0.02 fibres/mL – a review of control measures shall be completed in the work area;
  - Reading greater than 0.02 fibres/mL – works shall cease until the cause of contamination is identified and rectified;
- It is noted that these action levels adopted are more conservative than the exposure standard for airborne asbestos (0.1 fibres/mL (TWA)) as outlined in Workplace Exposure Standards for Airborne Contaminants (SWA 2018) for an 8-hour shift;
- The results of air monitoring will be available on a 24-hour turnaround time basis. While monitoring is undertaken, daily air monitoring reports shall be displayed in a common area outside of the asbestos work area (e.g. site office or lunch shed) or be able to be produced upon request;
- Monitoring requires to be undertaken until the containment cell / long term encapsulation of impacted soils is completed and validated.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Aspect	Reference	Responsible Person	Potential Impact	Cause	Risk	Management Objective
Air Quality – Chlorinated Ethenes	**6**	Site Environmental Manager, Site Supervisor	Exposure to site workers and / or surrounding residents to Asbestos Containing Material (ACM)	Unexpected discovery of ACM.	**Medium**	Minimise as far as possible the ACM exposure to site personal and surrounding residents as practicable.

Management Measures

During any works involving the active handling of soils known to be impacted with chlorinated ethenes:

- Air monitoring shall be undertaken using a field portable GC-PID in proximity of the area of soils handling and at representative locations on the site boundary at intervals of at least three times daily;
- Airborne levels of chlorinated ethenes inclusive of tetrachloroethene (PCE), trichloroethene (TCE) and cis-1,2-dichloroethene (cis-1,2-DCE) shall be quantified over a sampling duration of at least two min utes at each sample location;
- Airborne levels of PCE, TCE and cis-1,2-DCE shall be assessed to ambient air criteria as protective of site and business district exposures of 0.8, 0.008 and 0.03 mg/m^3 respectively. It shall be ensured that the monitoring instrument as adopted for the project is able to quantify to these levels;
- Where exceedances are reported then works shall be undertaken to eliminate and/or mitigate chlorinated ethene vapour emissions as consistent with the scope of actions available in this CEMP.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Aspect	Reference	Responsible Person	Potential Impact	Cause	Risk	Management Objective
Dust, Odour and Air Quality	**7**	Site Supervisor, Site personnel	Emission of dust that could have health and / or amenity impacts on nearby residents.	Demolition of structures, excavation of soils, vehicle movements and construction activities.	**High**	Prevention of dust travel beyond the site boundary.

Management Measures

- Exposed potentially impacted fill or soils in the walls and floors of excavations and stockpiles of spoil should be kept moist to prevent the generation of dust from these sources.
- Care should be taken to not over-wet excavations and/or stockpiles such that excess runoff is generated.
- Works should cease should visible dust be migrating from the work site area, until such time as dust is controlled or conditions causing dust migration (e.g. excessive wind) improve.
- Any non-compliances or migration of dust from site boundaries should be reported to the Environmental Manager and appropriate information recorded in the Environmental Incidents Register in **Appendix A.**
- Limit the height and size of stockpiles to with a maximum 2:1 height to width ratio.
- Stockpiles to be covered with a water proof material (i.e. HDPE plastic) and weighed down barrier when remaining for more than 7 days.
- Install temporary fencing with shade cloth screens along the boundary of the site.
- Apply a maximum speed limit of 10 km/h on surface and unsurfaced haul roads and in work areas.
- Trucks used for transport of spoil will be fully enclosed and covered to prevent escape of materials during transport.
- Static air monitoring should be undertaken at the along each site boundary by EPA approved air monitors on an ongoing basis throughout all construction stages and if any recordings are above adopted air monitoring criteria, works must cease immediately and mitigation measures such as dust suppression measures implemented immediately.
- Inspect monitoring readings in any event of high dust emission, these data observations should be recorded in the site register.
- All construction equipment will be maintained to ensure exhaust emissions comply with requirements of the relevant standards of the *Fuel Quality Standards Act 2000*.
- Inspect the site and nearby area daily for evidence of odours (if present) leaving the site. Where works are likely to encounter any offensive odours or if site conditions such as high winds occur, site inspections should be ongoing and a priority.
- If odours are encountered the following actions should be undertaken:
  - Reduction in earthworks activities within odorous material areas during adverse meteorological conditions; and,
  - Application of odour masking solutions at the odour source or between identified source(s) and receptor(s).
- Details of any complaints should be recorded in a site register and reported back to Council.
- If complaints are received regarding dust, the frequency of water spraying or dry removal will be increased and recorded in the site register.
- Inspect, and if required, sweep roads at the end of each day and / or when rain is likely.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.4.3 Flora and fauna

Aspect	Reference	Responsible Person	Potential Impact	Cause	Risk	Management Objective
Flora and Fauna	**8**	Supervisor, Site personnel	Unintended destruction of vegetation due to trampling by site equipment or storage of material or equipment and incorrect removal or trimming.	Unclear site induction regarding the maintenance of vegetation and improper signage of protected areas.	**Medium**	No unintentional removal of vegetation occurs.

Management Measures

- Where possible unload excavation machine, plant and equipment as close to where they are required to minimise the area being impacted.
- Ensure contractors are inducted in the avoidance of disturbing vegetation.
- Establish No Go Zones to restrict works to within the area of proposed disturbance and to minimise the potential for affecting flora and fauna outside of the work area.
- Do not place stockpiled materials inside vegetation protection areas or within 5 m of trees to be retained.
- Ensure stockpiling of soil that may contain seed of exotic species is away from adjacent vegetation or stormwater drains where they could be spread during rainfall events.
- Ensure all vehicles and equipment entering the site are weed free.
- Trees to be retained shall be managed and fenced off from the proposed development with a 1.8m high chain wire mesh supported by robust posts. Any tree to be retained must be clearly signed 'TREE PROTECTION ZONE, DO NOT ENTER'.
- No development or activity must occur within the fenced (Tree Protection Zone) TPZ.
- Demolition works within the TPZ of trees to be preserved shall be carried out so as to avoid damage to tree roots. Manual excavation shall be carried out under the supervision of the project Arborist to identify roots critical to tree stability. Where the Project Arborist identifies roots to be pruned within or at the outer edge of the TPZ, they should be pruned with a final cut to undamaged wood. Pruning cuts should be made with sharp tools such as secateurs, pruners, handsaws or chainsaws. Pruning wounds should not be treated with dressing or paints. It is totally unacceptable for roots within the TPZ to be pruned with machinery such as backhoes or excavators.
- Where roots within the TPZ are exposed by excavation, temporary root protection should be installed to prevent them drying out.
- All areas enclosed by protective fencing must have the entire ground surface mulched to a depth of 75 mm with composted Eucalyptus leaf and woodchip to help retain soil moisture and reduce erosion.
- Where stormwater and sewer lines need to be installed within the TPZ of trees nominated for preservation trenching for stormwater/sewer installation within the TPZ and SRZ shall be avoided. Adopt directional drilling/approved under boring techniques as per Section 4 of AS4970 CL.4.5 to avoid adverse impacts on tree roots.
- The crowns of all significant trees nominated for preservation are clear of the proposed development.
- Install tree trunk/ branch batten protection boards as per Section 4.5.2 of Australian Standard (AS4979-2009): Protection of Trees on Development Sites.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.4.4 Groundwater

Aspect	Reference	Responsible Person	Potential Impact	Cause	Risk	Management Objective
Groundwater	**9**	Site Environmental Manager, Site Supervisor, Site personnel	Interception of groundwater and contamination of surface water and soil.	Intrusive or penetrative works associated with exaction, service installation, trenching and foundations.	**Low**	No surface water or soil contamination as result of intercepted groundwater.

Management Measures

- No uncontrolled abstraction of groundwater at the site can occur without first assessing the quality of groundwater if required to be abstracted.
- If any potentially contaminated groundwater requires management during works on site, will be done so by either; removal as a waste by a licensed contractor and disposed off-site in accordance with relevant waste regulations and guidelines, or assessed and treated where required prior to discharge under appropriate approval to enable discharge to stormwater and for sewer (with treatment) if required.
- Avoid excavation below 6 m of the current surface level during construction due to reported groundwater levels (JBS&G 2019).
- In the case that groundwater is intercepted, the contractors must immediately cease any further excavation work and adopt the following protocol:
  - Intercepted groundwater must be contained and not enabled to leave the excavated pit, in the case of potential overflowing the rim of the excavation should be sandbagged;
  - Intercepted groundwater should be pumped from the excavation and into a sealed container, care should be taken not to withdraw more water than necessary;
  - The excavation should be appropriately backfilled and compacted; and,
  - The collected groundwater should be classified by an appropriately trained environmental consultant and if contamination levels are reported above adopted guidelines, removal as a waste by a licensed contractor and disposed off-site. If the groundwater is not classified as contaminated and achieves stormwater criteria, stormwater disposal is permitted.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.4.5 Waste Management

Aspect	Reference	Responsible Person	Potential Impact	Cause	Risk	Management Objective
Waste Management	**10**	Site Environmental Manager, Site Supervisor, Site personnel	Contamination of receiving environment by waste material.	Incorrect, or lack of classification of waste materials. Improper disposal of waste material.	**Medium**	No impact on receiving environment as result of waste.

Management Measures

- Demolition works are to be staged so as to allow segregation of materials types to maximum opportunities for off-site recycling. This shall at least include separation of asbestos based materials, masonry / concrete based materials, timber building materials etc;
- Demolition works are to be staged to ensure that asbestos containing materials / other potential hazardous materials (i.e. SMF, PCB containing capacitors etc) are removed from site structures prior to bulk demolition works. These materials shall be separated / segregated and disposed as hazardous materials as consistent with relevant provisions of NSW EP)A (2014);
- All asbestos containing materials as removed during demolition works are to be wrapped in plastic / placed in plastic wrapped waste bins and removed from site as asbestos waste;
- The remedial works require to be staged / undertaken in a manner to mitigate the requirement to dispose of soils from the site. This shall include controlled stockpiling / tracking of impacted and non-impacted soils, re-use of excavated soils to form the containment cell to re-instate excavation of contaminated soils and preferential selection of non-impacted virgin excavated natural material to be disposed form the site where there is a surplus of soils;
- Any construction waste soil or other soil material to be disposed off-site should be analysed and classified by an appropriately qualified and experienced environmental consultant, in accordance with relevant NSW EPA guidelines including the “Waste Classification Guidelines” 2014, prior to off-site disposal.
- Surplus demolition materials / soils not suitable to remain on-site are to be transported to an appropriately licensed waste facility by an EPA licensed waste contractor in accordance with relevant NSW EPA guidelines.
- Materials removed from site for waste disposal should be classified prior to removal and tracked from ‘cradle to grave’ with transport and disposal documentation maintained consistent with relevant regulatory requirements.
- Any asbestos waste must be removed, transported and disposed as special waste in accordance with relevant guidelines and legislative requirements.
- Remove rubbish and debris offsite to prevent it entering stormwater / drainage lines and causing environmental harm.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.4.6 Health and Safety

Aspect	Reference	Responsible Person	Potential Impact	Cause	Risk	Management Objective
Fire	**11**	Site Supervisor, Site personnel	Out of control fire which threatens safety and infrastructure.	Use of spark producing equipment on high fire risk days	**Low - Medium**	No occurrence of fire onsite.
Management Measures						
• Communicate total fire ban declarations and resultant work restrictions to staff during daily tool box briefings as required. • During total fire bans, fit spark arrestors to any items of plant that have the potential to discharge sparks. • All personnel involved in welding, grinding, thermal or oxygen cutting, heating or other fire or spark-producing operations will be trained in fire prevention, safety and basic fire-fighting skills. • Induction for all staff and subcontractors working on the site includes training on the potential environmental emergencies, relevant environmental safeguards and risk mitigation measures. • No smoking onsite						

Aspect	Reference	Responsible Person	Potential Impact	Cause	Risk	Management Objective
Safe Access and Security of the Site During Works	**12**	Site Environmental Manager, Site Supervisor	Injury or harm to site worker or general public.	Accessing the site and due to improper security or slips, trips and falls on the work site	**Medium**	No unauthorised access to site and no incidents of injury or harm onsite.
Management Measures						

• The site must be fenced, appropriately signed to inform and restrict unauthorised access.
• The site is appropriately lit and free from trip hazards to ensure safe access and reduce the risk of slip, trips and falls
• Only work during works hours and ensure site is securely locked up at all times.
• All personal onsite complete a site induction and are aware of hazards.
• Site workers only perform tasks within their capabilities and only operate machinery in which they are licensed.
• All site personal abide by relevant Occupational Health and Safety legislation provided in **Section 2.3**: Legislative Framework:
  ○ *Work Health and Safety Act 2011 (WHS Act 2011)*
  ○ *Work Health and Safety Regulation, 2017 (WHS Regulations, 2017)*
• All site personal must also abide by national relevant national legislation including:
  ○ *Road Transport Reform (Dangerous Goods) Act 1995*
  ○ National Code of Practice for the Prevention of Falls in General Construction (2008)
  ○ Workplace Injury and Disease Recording Standard in the Workplace (AS 1885.1-1990)
• All loading, unloading and handling of materials for the project must be carried out wholly within the site boundaries.
• Construction vehicle access and egress must be undertaken from Bay Road only.
• During construction, delivery vehicles, concrete trucks and trade vehicles must be unloaded on site as close as possible to the required location.						

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Aspect	Reference	Responsible Person	Potential Impact	Cause	Risk	Management Objective
Contaminated Material Handling	**13**	Site Environmental Manager, Site supervisor, site personnel	Exposure to site occupants and workers to soil contamination.	Not wearing personal protective equipment (PPE), unsecure access, and incorrectly handling soil or site water.	High	No one is unacceptably exposed to soil contamination.

Management Measure - Preliminary Construction Phase

- The site must be suitably signposted and barricaded to inform site occupants / workers to the potential environmental hazards within the site.
- All site workers must wear appropriate PPE onsite, which includes long trousers, long sleeved shirts, appropriate protective footwear and gloves.
- All site workers are to be inducted. The induction is to include environmental responsibilities and hazards associated with contaminated soils (i.e. when in contact with contaminated soils, workers must wear gloves, avoid touching their face and mouth, wash hands before eating and after being onsite)
- The site entrance must be securely shut during works and locked afterhours to prevent unauthorised access.
- All site boundaries should be secured to prevent any unauthorised access.
- Corrective and / or preventive actions are developed and implemented as soon as practicable.
- Records are kept of any environmental nonconformities and associated action taken in the Environmental Incidents Register Provided as **Appendix A.**
- Unexpected finds, such as unexpected soil contamination (e.g. staining, odorous), asbestos containing material etc should be managed in accordance with the unexpected finds protocol provided in **Appendix B.**
- Any unexpected finds during the construction phase should be notified to the Site Manager for appropriate action.

Aspect	Reference	Responsible Person	Potential Impact	Cause	Risk	Management Objective
Unexpected Finds	**14**	Site Environmental Manager, Site supervisor, site personnel	Exposure of anyone onsite to contaminants of potential concern.	Exposure of potentially impacted soil through earthworks and other subsurface works.	**Medium - High**	All unexpected finds and environmental non-conformities are reported and ameliorated immediately.

Management Measure - Preliminary Construction Phase

- Unexpected finds, such as unexpected soil contamination (e.g. staining, odours), asbestos material, unexploded ordnances, small arms ammunition etc should be managed in accordance with the unexpected finds protocol provided in **Appendix B.**
- The induction program for site staff and contractors includes the need to notify the Site Manager of any nonconformities and unexpected finds to the CEMP as soon as practicable.
- Corrective and / or preventive actions are developed and implemented as soon as practicable.
- Records are kept of any environmental nonconformities and unexpected finds and associated action taken in the Environmental Incidents Register Provided as **Appendix A.**
- Any unexpected finds during the construction phase should be notified to the Site Manager for appropriate action.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.4.7 Amenity

Aspect	Reference	Responsible Person	Potential Impact	Cause	Risk	Management Objective
Noise	**15**	Site Environmental Manager, Site Supervisor, Site personnel	Emission of annoying and impeding noise levels.	Use of loud and unserviced equipment	**Low - Medium**	Minimal emission of noise and no / few complaints, and any complaints resolved.

Management Measures

- Notify the Penrith City Council at least 20 business days prior to commencement of work.
- Only conduct works during the specified working hours.
- Proposed working hours on this project are:
  - 7:00 am to 6:00 pm Monday to Friday; and
  - 8:00 am to 3:00 pm Saturdays.
- No work will be conducted on Sundays and Public Holidays.
- Complaints related to noise or any other aspect of works will be noted by the contractor and forwarded to the Project Manager for resolution.
- All deliveries to and from the site must be made during the scheduled work hours.
- Noise from machinery will be minimised by:
  - Selecting machinery that makes less noise;
  - Enclosing noisy equipment, if practicable;
  - Fitting and maintaining appropriate mufflers on earth-moving and other vehicles on site;
  - Plant will be turned off or powered down when not in use;
  - Ensuring plant is well maintained; and,
  - Ensuring plant is not idling unnecessarily.
- Engine and exhaust brakes will not be used on site except for emergency situations.
- Neighbours will be informed of the nature, duration and hours of work if noise from construction activities are likely to impact on them, prior to works being carried out.
- Details of any complaints should be recorded in a site register and reported back to Council.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7. CEMP Review

It may, on occasion, be necessary to revise the CEMP to reflect changes to legislation and/or regulatory requirements and/or changes in site conditions, where these influence implementations of the CEMP, for example:

- Revision of the CEMP will be necessary if the details in the CEMP have changed (i.e. further assessment provides additional data to inform the CEMP or unexpected impacts are encountered during site works);
- Revision of the CEMP will be necessary on completion of development works to incorporate the design details;
- Revision of the CEMP should be undertaken by an appropriately qualified and experienced environmental consultant (JBS&G);
- Copies of the revised CEMP should be distributed to the current Environmental Manager for on-going implementation;
- A copy of the revised CEMP should be provided to Council for review and comment following any changes; and
- The Site Environmental Manager should ensure that the most current, up-to-date, CEMP is provided to any workers on site as part of the CEMP induction requirements for works on site.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

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Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Changes to the subsurface conditions may occur subsequent to the works described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix A Environmental Incidents Register

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

CEMP INDUCTION REGISTER

The purpose of the induction register is to acknowledge acceptance and compliance with the procedures outlined within this CEMP by signing the attached log. Copies of this document must be made available for review and be readily available at the job site.

The Induction Register is required to be completed by each person inducted into the CEMP.

Person	Position	Signature	Date

COMPLAINTS AND ENVIRONMENTAL INCIDENT REGISTER

The purpose of the Complaints and Environmental Incident Register is to maintain a register of complaints from local residents or concerned parties, which will include a record of any action taken with respect to the complaints.

The Complaints and Environmental Incident Register is required to be completed immediately following the receipt of any complaints associated with works undertaken at the site.

Date	Time	Type of Communication	Name, address and phone number of complainant	Nature of Complaint	Corrective Action	Dates of Response	Signature

SURFACE COVER – AD HOC INSPECTION CHECKLIST

The following checklist should be used on an ad hoc basis. It may be appropriate for such assessments to be made following heavy rainfall episodes which could disturb or remove surface cover and expose soil materials or visible ACM.

Compliance Questions	Yes (√/x)	No (√/x)	Outcome
Site Capping Layer Inspection Date:			
Is there any degradation in site cover?			If no, no further action is required.
			If yes, the site surface should be repaired appropriately to ensure subsurface soils are adequately covered.
Have any soils or visible ACM been exposed?			If no, no further action is required.
			If yes, any visible ACM fragments exposed will need to be removed in compliance with the requirements of the WorkCover Code of Practice 'How to manage and control asbestos in the workplace', other relevant regulatory requirements; Any other waste material exposed or other unexpected finds should be managed in compliance with this EMP and relevant regulatory requirements.

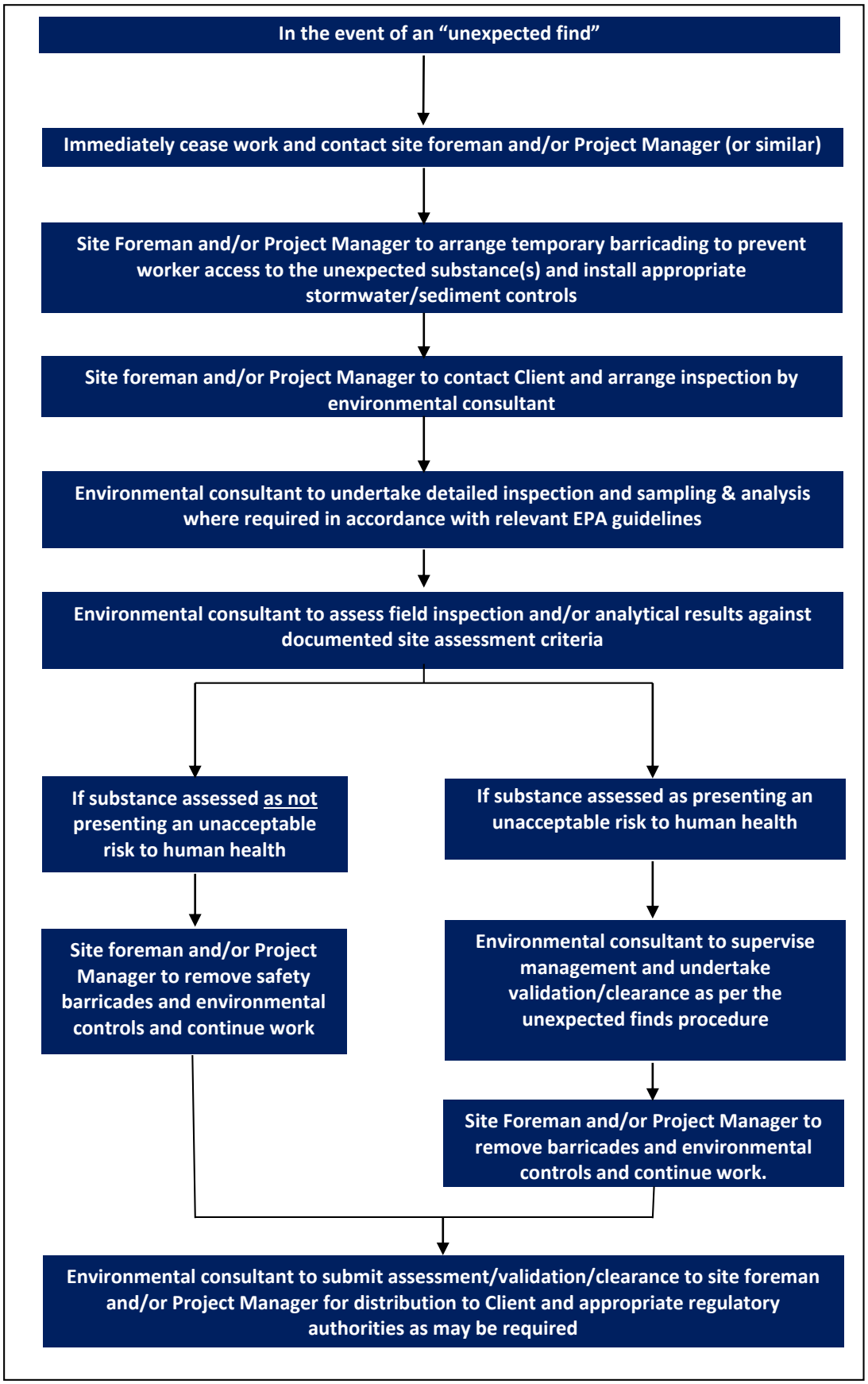
DUST MANAGEMENT CHECKLIST

During intrusive works that will disturb asbestos or other impacted soils, the following checklist should be completed on a daily basis.

Compliance Questions	Yes (√/x)	No (√/x)	Outcome
Dust Management Inspection Date:			
Has all exposed soil/fill in stockpiles and walls and floors of excavations been kept moist?			If no, corrective actions such as wetting down the area with a hose must be taken.
			If yes, no further action is required.
Is excess run-off being caused by over wetting?			If no, no further action is required.
			If yes, stop wetting and ensure appropriate sediment controls are in place.
Is visible dust migrating from the work site area?			If no, no further action is required.
			If yes, work should cease until such time as dust is controlled or conditions causing dust migration (e.g. excessive wind) improves.
Any non-compliances or migration of dust from site boundaries should be reported to the **Environmental Manager** and appropriate information recorded in the Environmental Incidents Register.			

Appendix B Unexpected Finds Protocol

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix C CEMP Compliance Audit Checklist

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Penrith City Park CEMP Compliance Audit Checklist

Date:			Assessor:	
CEMP Ref	**Potential Impact**	**Requirement**	**Evidence of Implementation**	**Compliance (Y/N)**
1	Cross contamination of clean soil as result of stockpiling of excavated material.	Contaminated material stockpile area is validated clean after use and minimal runoff and erosion occurring onsite.		
2	Importation of contaminated material.	No contaminated material entering the site or reuse of contaminated soil onsite from site.		
3	Erosion of stockpiled material into surface water.	No stockpile material entering surface water bodies.		
4	Contamination of soil and / or water from fuel spills.	Eliminate soil or water contamination onsite due to oil or fuel spills.		
5	Exposure to site workers and / or surrounding retail areas to Asbestos Containing Material (ACM)	Minimise as far as possible the ACM exposure to site personnel and surrounding businesses as practicable. Confirm results of monitoring.		
6	Exposure to site workers and / or surrounding retail areas to chlorinated ethene vapours	Minimise as far as possible the vapour exposure to site personnel and surrounding businesses as practicable. Confirm results of monitoring.		
7	Emission of dust that could have health and / or amenity impacts on nearby residents.	Prevention of dust travel beyond the site boundary.		
8	Unintended destruction of vegetation due to trampling by site equipment or storage of material or equipment and incorrect removal or trimming.	No unintentional removal of vegetation occurs.		
9	Interception of groundwater and contamination of surface water and soil.	No surface water or soil contamination as result of intercepted groundwater.		
10	Maximising recycling opportunities / waste minimisation.	Segregation of waste materials as per waste classification / potential to recycle		
10	Contamination of receiving environment by waste material.	No impact on receiving environment as result of waste.		
10	Waste tracking	Material / waste tracking records available for all material removed from site.		

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Date:			Assessor:	
CEMP Ref	**Potential Impact**	**Requirement**	**Evidence of Implementation**	**Compliance (Y/N)**
11	Out of control fire which threatens safety and infrastructure.	No occurrence of fire onsite.		
12	Injury or harm to site worker or general public.	No unauthorised access to site and no incidents of injury or harm onsite.		
13	Exposure of anyone onsite to contaminants of potential concern.	All unexpected finds and environmental non-conformities are reported and ameliorated immediately.		
14	Appropriate response to unexpected finds	Documentation to record unexpected finds and evidence of appropriate persons to respond to unexpected finds.		
15	Emission of annoying and impeding noise levels.	Minimal emission of noise and no / few complaints, and any complaints resolved.		

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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		Name	Name	Signature	Date
A	Matthew Parkinson	Chris Bielby			14/12/2020

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Version: 1, Version Date: 14/04/2021

Appendix I Draft Long Term Environmental Management Plan

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

DRAFT

Penrith City Council

Long Term Environmental Management Plan

Penrith Central Village Park
134-144 Henry St
42-50 Station St and
Allen Place Car Park
PENRITH, NSW

14 December 2020

58140/134346 (Rev A)

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Version: 1, Version Date: 14/04/2021

DRAFT

Penrith City Council

Long Term Environmental Management Plan

Penrith Central Village Park
134-144 Henry St
42-50 Station St and
Allen Place Car Park
PENRITH, NSW

14 December 2020

58140/134346 (Rev A)

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table of Contents

Abbreviations v

1. Introduction 1
   - 1.1 Background 1
   - 1.2 Objectives 2
2. Summary of Site Conditions 3
   - 2.1 Site Details 3
   - 2.2 Site Description 3
   - 2.3 Extent of Environmentally Impacted Material Remaining Onsite 3
   - 2.4 Summary of Identified Environmental Contamination Issues 3
     - 2.4.1 Asbestos 3
     - 2.4.2 Chlorinated Ethenes 4
   - 2.5 Site Cover Layers 5
     - 2.5.1 Requirements 5
     - 2.5.2 Extent of Marker Layers and Capping 5
3. Application and Enforcement of LTEMP and Responsibilities 6
   - 3.1 Application of LTEMP 6
   - 3.2 Site Owner 6
   - 3.3 Persons with Management or Control of the Workplace 7
   - 3.4 Summary of Provisions of this LTEMP 7
4. Contaminated Soil and Asbestos Management Strategy 8
   - 4.1 General 8
   - 4.2 Potential Future Earthworks 8
     - 4.2.1 Shallow Intrusive Works 8
     - 4.2.2 Deep Intrusive Works 9
     - 4.2.3 Reinstatement of Capping 10
   - 4.3 Specific Requirements for Those Working with Asbestos Impacted Material 10
   - 4.4 Soil Management 11
   - 4.5 Dust Management 11
   - 4.6 Off-Site Disposal and Waste Management 11
   - 4.7 Emergency Preparedness and Response 12
   - 4.8 Building / Dwelling Controls 12
   - 4.9 Capping Inspections 12
5. Health and Safety Management 13
6. Revision of the LTEMP 14
7. Limitations 15

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

List of Tables

Table 2.1: Summary Site Details 3
Table 4.1: Emergency Contacts.....12
Table 4.2: Capping Inspections 12

List of Figures

Figure 1 Site Location
Figure 2 Long Term Environmental Management Plan Subject Area

Appendices

Appendix A Survey Plans
Appendix B Photographs
Appendix C LTEMP Record of Induction Form
Appendix D Capping Reinspection Register
Appendix E Asbestos Related Works Record

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Abbreviations

Term	Definition
ACM	Asbestos Containing Material
AF	Asbestos Fines
AMP	Asbestos Management Plan
DP	Deposited Plan
EPA	Environment Protection Authority
FA	Fibrous Asbestos
JBS&G	JBS&G Australia Pty Ltd
JSRA	Job Safety Risk Assessment
LAA	Licensed Asbestos Assessor
LTEMP	Long Term Environmental Management Plan
NOHSC	National Occupational Health and Safety Commission
NSW	New South Wales
PAHs	Polycyclic Aromatic Hydrocarbons
PCC	Penrith City Council
PPE	Personal Protective Equipment
RAP	Remedial Action Plan
SWMS	Safe Work Method Statement
WHS	Work Health and Safety

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1. Introduction

1.1 Background

JBS&G Australia Pty Ltd (JBS&G) was engaged by Penrith City Council (PCC, the client) to prepare a Long Term Environmental Management Plan (LTEMP) for the future management of the encapsulated environmentally impacted soils within the western portion of the Penrith City Village Park (City Park, the site, **Figure 1**). The site is legally identified as Lot 1 in DP 164798 and Lot 1 in DP 252457 (134 to 138 Henry Street), Lot 10 and 11 in DP 553665 (140 to 142 Henry Street), Lot 2 in DP 556075 (144 Henry Street), Lot 3 in DP1200790 (42 to 44 Station Street), Lot 1 in DP 526304 (48 to 50 Station Street) and Lot E in DP 163176 (46 Station Street). Notwithstanding the descriptions, portions of the site are also referred to as being present with the former Allen Place Car Park. The area of the City Park occupies a total area of approximately 7000 m^2. The site is referred to as the extent of encapsulated environmentally impacted soils and is restricted to an area of 1300 m^2 in the western portion of the City Park.

Contamination has been identified within the extent of the site prior to the redevelopment as the City Park. This has included asbestos containing materials (ACM) as present within historically imported fill materials as used with the initial development of the site and chlorinated ethene impacted soils as associated with a dry cleaners that previously operated at 134-138 Henry St.

The contaminated soils have been identified and segregated during the construction of the City Park and consolidated. The extent of contaminated soils has then been placed into a purpose designed containment within the site sub-surface to be managed into the future. An engineered cap is placed over the contained soils to control potential human and ecological exposures in the future.

This LTEMP is also required as part of the contaminated land site audit process. The site is considered suitable for use given the presence of an appropriately engineered capping layer to retain the contaminated soils and subject to implementation of this LTEMP. This LTEMP is required to ensure that the environmentally impacted soils (including asbestos affected materials) are appropriately managed to ensure continued protection of human health for future site workers, occupiers, visitors and contractors engaged to undertake works within the City Park, or otherwise members of the public whom will use the recreational / open space facilitations associated with the Park.

Through the presence of asbestos as a known contaminant in the soils this LTEMP has been prepared specifically in accordance with Clause 429 of the *Work Health and Safety Regulation* (2017) that states, *"If asbestos or ACM is identified at a workplace under clause 422, or likely to be present at a work place from time to time, a person with management or control of the workplace must ensure a written plan (an asbestos management plan) for the workplace is prepared".*

This LTEMP applies only to the environmentally impacted soils as present within the encapsulated area identified as the western portion of the City Park, as shown in **Figure 2**, and does not apply to the greater City Park area. It is not intended to apply to major excavations, earthworks or construction activities. A specific management plan should be prepared in the event that any major works are proposed for the encapsulated area.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1.2 Objectives

The objectives of this LTEMP are to:

- Protect the health of site occupants, contractors and visitors from the residual environment hazards (specifically inclusive of asbestos) during the future operation of the City Park;
- Outline ongoing management requirements to ensure that the risk posed by environmentally impacted soils identified at the site (within the encapsulated area) is properly managed and maintained;
- Provide guidance on the responsibilities of maintaining the requirements of this LTEMP;
- Provide guidance on the appropriate control measures to be implemented in the event that the capping and/or marker layer requires to be breached; and
- Provide guidance on the appropriate procedures to manage works within environmentally impacted materials (specifically inclusive of asbestos as per requirements of the *Work Health and Safety Regulation* 2017).

It is expected that this LTEMP will be incorporated into the overall maintenance and environmental management procedures for the ongoing operation of the City Park.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2. Summary of Site Conditions

2.1 Site Details

The site location is shown on **Figure 1**. The extent of the City Park and associated cadastral boundaries are shown on **Figure 2**. The site details are summarised in **Table 2.1** and described in detail in the following sections.

Table 2.1: Summary Site Details

Property Identification and Street Addresses	The site is comprised of the following legal properties: • Lot 1 in DP 164798 and Lot 1 in DP 252457 – 134 to 138 Henry Street • Lot 10 and 11 in DP 553665 – 140 to 142 Henry Street • Lot 2 in DP 556075 – 144 Henry Street • Lot 3 in DP1200790 – 42 to 44 Station Street • Lot 1 in DP 526304 – 48 to 50 Station Street • Lot E in DP 163176 – 46 Station Street In addition, the site area includes portions of the Allen Place Car Park.
Local Government Authority	Penrith City Council
Approximate MGA Coordinates (MGA 56)	Easting: 286582.2 Northing: 6262912.7
Site Zoning	Commercial Core (B3) and Public Recreation (RE1) under Penrith Local Environmental Plan (LEP) 2010
Current Use	Commercial (car parking, retail and services)
Previous Use	Commercial/industrial (car parking, dry cleaning and general retail/services) and residential
Proposed Use	Public open space
Site Area	Approximately 0.71 ha

2.2 Site Description

The site is characterised as the area of encapsulated environmentally impacted soils within the extent of the City Park and consists of a range of soft and hard landscaped areas as intended to be used for a range of open space / recreational purposes. The impacted soils (the extent of the site) are retained in the western portion of the City Park at a distance of at least 30 m from any buildings / basements etc in proximity of the City Park. Reference can be made to survey plans provided as **Appendix A**.

2.3 Extent of Environmentally Impacted Material Remaining Onsite

Environmentally impacted material as affected with elevated levels of chlorinated ethenes and ACM has been retained in the western portion of the site. The containment is present over an area of 1300 m^2 and the impacted spoils are present from a depth of 1 m below the site surface to a maximum depth of 4 m bgs. The extent of the containment zone is shown on **Figure 2** and defined by surveys provided as **Appendix A**.

2.4 Summary of Identified Environmental Contamination Issues

Contaminated soils, inclusive of chlorinated ethenes and friable and non-friable asbestos remains in the ground beneath the capping and marker layer and needs to be managed.

2.4.1 Asbestos

Friable asbestos is defined in the Safe Work Australia *Code of Practice How to Manage and Control Asbestos in the Workplace* (SWA 2016a) as being *"…material that is in a powder form or that can be crumbled, pulverised or reduced to a powder by hand pressure when dry, and contains asbestos".*

Non-friable ACM is defined by SWA (2016a) as being *"…material containing asbestos that is not friable asbestos. Including materials containing asbestos fibres reinforced with a bonding compound"*.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Mechanical disturbance of ACM fragments and disturbance of soils may result in the release of fibres and therefore, such activities should be managed to prevent any fibres becoming airborne. Similarly the same activities can potentially give rise to release of soil particulates affected by chemical contaminants. The health effects of (specifically) asbestos are detailed in enHealth (2005) *Management of Asbestos in the Non-Occupational Environment*.

The primary issue associated with the asbestos remaining beneath the site capping and marker layer is managing the risk of inhalation of respirable fibres if the underlying asbestos impacted materials were to be disturbed. The primary issue of the potentially co-occurring chemical based contaminants is direct contact to the impacted soils and/or potential inhalation of impacted particulates generated from the soils and/or vapour intrusion from the impacted spoils to buildings / dwellings as constructed in proximity of the containment.

A secondary issue with the presence of the environmentally contaminated soils remaining at the site is disposal of excess spoil that may be impacted with chemical contaminants and/or asbestos in the event that excavation of materials beneath the capping and marker layer is required.

A description of the marker layer used to identify the boundary between the capping and potentially impacted materials is provided in **Section 2.5**. Management measures to deal with these materials in the event that it becomes necessary for the capping and marker layer to be breached are provided in **Section 4**.

2.4.2 Chlorinated Ethenes

Chlorinated ethene contamination in soils was found to pose a risk via vapour intrusion to potential future buildings constructed on the site and basements / existing buildings in proximity of the site. Potential human exposure may occur within existing / future buildings by inhalation of chlorinated ethene vapours caused to be present in the buildings / enclosed spaces by diffusive and advective processes. The containment area has been sufficiently separated from the location of existing buildings in proximity of the City Park to preclude the potential lateral migration of vapours to these buildings.

Chlorinated ethene impacted soils retained on other areas of the site are at insufficient levels to pose a potential risk to site users occupants in the future. This includes potential direct exposure of future excavation / maintenance workers to the impacted soils.

This validated condition needs to be maintained in the future by the retention of these soils in proximity of their current location and the exclusion of the construction of buildings overlying the retained soils. Potential recharge of surface water through the retained soils (by infiltration) requires to be minimised by the use of hardstand and a low permeability capping material.

The retained chlorinated ethene impacted soils can pose a potential ecological risk by leaching of the chlorinated ethene contaminant by infiltrating surface water / seepage water and migration of leachates to affect groundwater. Chlorinated ethene impacted groundwater can migrate to affect potentially sensitive ecological receptors in areas of groundwater discharge. Control of surface water infiltration through the retained chlorinated ethene impacted soils will control potential ecological risks.

The principal health risk associated with the chlorinated ethene impacted soils is potential volatilisation of the chlorinated ethene constituents and vapour movement into indoor buildings. Intruding vapours can be caused to accumulate within buildings which can pose a health risk to building occupants. Separation of the chlorinated ethene impacted soils from buildings / indoor spaces by at least 30 m will eliminate this potential.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2.5 Site Cover Layers

2.5.1 Requirements

The requirements for the capping and marker layers were specified in *Penrith City Council Penrith Central Park Village Remedial Work Plan 134-144 Henry Street, 42-50 Station Street, and Allen Place Car Park rev B*, 8 December 2020, JBS&G Australia Pty Ltd (JBS&G 2020). Distinct requirements have been provided for areas that are located in areas of surface hardstand, and areas that are in landscaped / non-paved areas of the PCVP. In summary in areas of hardstand, the requirements were:

- Placement of a visual marker layer overlying the environmentally impacted soils consisting of a bright orange coloured non-woven polyester continuous filament or PET (such as nonwoven geotextiles) or similar with a minimum density of approximately 150 grams per square metre (or equivalent); and
- Placement of a capping layer of at least 1.0 m of non-impacted soils overlying the marker layer and across the extent of impacted soils.

In areas of non-hardstand (i.e. landscaped / garden / grassed areas of the site), the requirements were:

- Placement of an initial low permeability material directly overlying the impacted soils. This has been nominated in JBS&G (2020) as consisting of a geosynthetic clay liner (GCL) with a hydraulic conductivity of less than 5×10^{-11} m/s (as consistent with the product specifications of Bentofix); and
- Placement of a visual marker layer directly overlying the GCL consisting of a bright orange coloured non-woven polyester continuous filament or PET (such as nonwoven geotextiles) or similar with a minimum density of approximately 150 grams per square metre (or equivalent); and
- Placement of a capping layer of at least 1.0 m of non-impacted soils overlying the marker layer and across the extent of impacted soils.

The physical capping is required to prevent ready access to soils contaminated with asbestos and other chemical contaminants. The physical barrier layer installed at the site is shown on the survey diagrams provided in **Appendix A**.

2.5.2 Extent of Marker Layers and Capping

The marker layer and capping is present overlying the extent of the contained impacted soils within the western portion of the PCVP. The precise extent is shown on **Appendix A**. Photographs of the installation of the low permeability liner, capping and marker layer are provided in **Appendix B**.

The extent of the containment within the western portion of the site is covered by a marker layer and capping (consisting of pavement or non-impacted soils), which must be maintained to prevent future site users, occupiers, visitors and contractors from being potentially exposed to the retained environmentally impacted soils. No dwellings / buildings may be constructed within 30 m of the extent of the containment.

Providing the marker layer and capping are maintained and control measures herein are successfully implemented in accordance with this LTEMP, there will be no health risks associated with contaminated soils remaining on the site, since there will be no direct pathways for site occupants to be exposed to the retained contamination.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3. Application and Enforcement of LTEMP and Responsibilities

3.1 Application of LTEMP

This LTEMP will apply indefinitely for future site operations.

The requirements of this LTEMP are intended to apply to any routine activities within the site which could involve disturbance or exposure of retained contaminated soil beneath the capping and marker layer but not limited to:

- Underground utility installation, maintenance or removal; or
- Excavations (e.g., dug, cut, piled or bored).

It is not intended that the LTEMP apply to major excavations, earthworks or construction activities. A specific management plan should be prepared if major works are proposed within the area of the encapsulated contaminated soils.

Section 4.2 provides requirements for shallow and deep intrusive works, however, disturbance of the marker layer should be avoided, if possible. As noted in **Section 4.2.2**, approval for deep intrusive works must be sought from the person/s with management or control of the workplace who is responsible for the enforcement of the LTEMP (**Section 3.3**). The person responsible for enforcement of the LTEMP will assess whether the works are necessary or if there is an alternative that will not result in exposure of environmentally impacted soil.

3.2 Site Owner

It is the responsibility of the Site Owner to ensure that:

- A copy of this LTEMP must be provided to all persons acquiring ownership of all or part of the site (Site Owners).
- A site owner must provide a copy of this LTEMP to any successor in Title.
- A site owner must ensure that a copy of this LTEMP is provided to all persons with management or control of a workplace at the site.
- A person/s with management or control of the workplace (specifically referred to the area of encapsulated contaminated soils) is made responsible for the implementation and maintenance of the provisions of this LTEMP.
- A person in a senior management position in the organisation is appointed as Site Environmental Manager and given the responsibility for ensuring the maintenance of the provisions of this LTEMP. The Site Environmental Manager may appoint appropriate personnel to implement the LTEMP day to day but will remain the responsible manager to whom the appointed personnel must report.
- Site personnel or contractors that must conduct intrusive works at the site are inducted into the LTEMP and are aware of their responsibilities with regard to health and safety and protection of the environment.
- A copy of this LTEMP is supplied to anyone conducting intrusive works on the site.
- The integrity of the marker layer and capping and/or hardstand / GCL liners is maintained by application of the procedures outlined in this LTEMP.
- The health and safety and environmental requirements specific to the contamination issues on the site, as outlined in this LTEMP, are complied with.
- Environmental incidents are reported in a timely manner to the appropriate statutory authorities, as necessary in accordance with legislation.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.3 Persons with Management or Control of the Workplace

The person/s with management or control of the workplace shall be responsible for the implementation and maintenance of the provisions of this LTEMP for the area of encapsulated contaminated soils.

Specifically, the persons/s with management or control of the workplace shall be responsible for:

- Ensuring the required routine inspections of the encapsulated area are completed and accurate records maintained;
- Organising appropriate works in the event that unexpected breaches of the capping and/or marker layers are encountered;
- Inducting relevant personnel, contractors and visitors into the requirements of this LTEMP. Detailed records of personnel inducted into the conditions of this LTEMP shall be kept (**Appendix C**);
- Ensuring any personnel or engaged contractors undertaking work that penetrates the depth of the capping and marker layer are aware of their responsibilities in relation to the encapsulated chemical-based contaminants potentially present and friable asbestos impacted materials known to be present;
- Ensuring any disturbance to the capping and marker layer are appropriately reinstated in accordance with the requirements of this LTEMP; and
- Documenting and updating records to reflect any works completed within the encapsulated area that may have extended below the depth of the capping and/or marker layer (**Appendix E**).

3.4 Summary of Provisions of this LTEMP

The provisions of this LTEMP are summarised as follows:

- Site personnel or contractors required to conduct intrusive works at the site must be inducted into the LTEMP and must be aware of their responsibilities with regard to health and safety and protection of the environment;
- A copy of this LTEMP is to be supplied to all persons conducting intrusive works on the site;
- The integrity of the capping and marker layers must be maintained by application of the procedures outlined in this LTEMP; and
- The health and safety and environmental requirements specific to the potential chemical constituent and friable asbestos hazards within the encapsulated area as outlined in this LTEMP must be complied with.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4. Contaminated Soil and Asbestos Management Strategy

It is expected that this LTEMP will be incorporated into the overall maintenance and environmental management procedures for all workplaces at the site.

4.1 General

The management procedures provided in the following sections have been primarily based on control of potential hazards that occur from asbestos contaminated soils / asbestos hazards. The nature of the potential co-occurring chemical hazards is that management procedures as designed for asbestos hazards will be sufficient to control potential risks as will occur with potential co-occurring chemical hazards (typically including chlorinated ethenes).

4.2 Potential Future Earthworks

The management procedures (provided in the following sections) are to be implemented during all routine intrusive works at the site including any potential future small-scale earthworks on the site (e.g. excavation for service installation or maintenance, tree planting). Major works within the area will require specific management controls.

There are two types of intrusions that may be undertaken at the site that would require management:

- Disturbance of the capping soils (shallow intrusive works); or
- Breach of the marker layer generally comprising excavations undertaken beyond a depth of 1 m below the ground surface.

Because activities breaching the marker layer entail greater risk than activities that simply disturb the upper depth of capping soils, different procedures apply to shallow and deep intrusive works, as outlined in the following sections.

4.2.1 Shallow Intrusive Works

These provisions for shallow intrusive works apply to works above the marker layer (i.e. works within the capping soils).

Where shallow intrusive works are required, the following management measures will apply:

- Approval for the works must be sought from the person/s with management or control of the workplace who is responsible for the enforcement of this LTEMP. A standing / long-term approval would be appropriate for persons engaged as gardeners / maintenance workers within the site;
- Site personnel or contractors required to conduct intrusive works at the site must be inducted into the LTEMP and must be aware of their responsibilities with regard to health and safety.
- A copy of this LTEMP is to be supplied to all persons conducting intrusive works on the site.
- Workers are not required to wear additional personal protective equipment (PPE) beyond normal site requirements for shallow intrusive works.
- Air monitoring is not required provided the environmentally impacted material beneath the marker layer is not disturbed.
- The marker layer shall not be disturbed, and any capping materials disturbed should be reinstated consistent with the description in **Section 2.5.2** of this LTEMP. Where disturbed, the capping materials should be separately stockpiled, managed and reinstated consistent

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

with this LTEMP (as applicable and appropriate). This shall include re-instatement of any areas of hardstand where hardstand is required to be removed.

- Any repairs to the capping and/or pavement (i.e. hardstand) overlying the marker layer shall be recorded as outlined in **Section 4.7** and changes should be detailed in an updated survey plan **(Appendix A)**, if required.

4.2.2 Deep Intrusive Works

These provisions for deep intrusive works apply to works that will extend below the marker layer (i.e. within encapsulated environmentally impacted materials). This is below the capping soils and marker layer in the site areas underlying paved / hardstand areas, or otherwise underlying the capping layer, marker layer and GCL in non-paved / landscaped / gardens areas of the site.

Where deep intrusive works are required, the following management measures will apply:

- Prior to any deep intrusive work commencing, approval for the works must be sought from the person/s with management or control of the workplace who is responsible for the enforcement of the LTEMP (**Section 3**) who will assess whether the works are necessary or if there is an alternative that will not result in exposure of environmentally impacted soil and whether the works are required to be carried out by a specialist contractor. The person/s with management or control of the workplace must also review and approve the Job Safety Risk Assessment (JSRA) and Safe Work Method Statement (SWMS) for the works and ensure that site personnel and/or contractors who will undertake the works understand the requirements of the LTEMP.
- Site personnel or contractors required to conduct deep intrusive works at the site must be inducted into the LTEMP and must be aware of their responsibilities with regard to health and safety, including those noted in **Section 4.3** following.
- A copy of this LTEMP is to be supplied to all persons conducting deep intrusive works on the site.
- The works area must be isolated from casual entry using temporary barriers and only personnel inducted in the requirements of the site LTEMP will be permitted to enter the works area.
- Sufficient space must be provided within the works area to allow stockpiling of spoil from excavations, if required, in accordance with **Section 4.4**.
- In the event that materials from under the marker layer must be excavated, a water supply must be provided to the works area for the purpose of maintaining potential environmentally impacted soil in the excavations and stockpiles in a moist state.
- Personnel entering the works area must wear appropriate PPE in accordance with **Section 4.3.**
- Decontamination procedures must be undertaken in accordance with **Section 4.3**.
- Stockpiles of excavated spoil must be managed in accordance with **Section 4.4**.
- Air monitoring to be undertaken in accordance with **Section 4.3**.
- Once the works are complete, the capping and marker layer shall be reinstated with materials of similar nature as were originally present, as described in this LTEMP. Where materials are imported for use in the capping layer, if required, they must be validated as suitable for the site use. In the case that the works were undertaken in an area of landscaping / garden and the GCL was removed, new replacement GCL shall be re-installed

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

with the reinstatement of the excavation at the same depth at which the original was removed. The removed (existing) GCL must not be re-used and must be disposed of.

- Areas of removal of hardstand / paving must be replaced with hardstand / paving in the reinstatement of the site.
- Any repairs to the capping and/or pavement shall be recorded as outlined in **Section 4.8** and changes should be detailed in an updated survey plan **(Appendix A)**, if required.

4.2.3 Reinstatement of Capping

Following potential works as completed as per **Section 4.2.1** or **4.2.2**, there may be a requirement to supply new 'capping material' to the site to replace existing capping material as consumed by the works. Capping material is to consist of virgin excavated natural material (VENM) or excavated natural material (ENM) and pavement or a GCL meeting the requirements of **Section 2.5.1** where observed to be removed during the works.

Where pavement is used a minimum thickness of 50 mm is required.

Where VENM or ENM are used, then appropriate validation assessment, inclusive sampling and analysis must be available as consistent with relevant NSW EPA guidelines or otherwise resource recovery exemptions. The person responsible for the implementation of the LTEMP must be provided with all relevant copies of documentation certifying the suitability of capping material.

4.3 Specific Requirements for Those Working with Asbestos Impacted Material

Asbestos-containing materials are present and friable asbestos is known to be present in soil underlying the marker layer. Work involving any breaches of the capping and marker layer, (i.e. deep intrusive works exceeding a depth of 1.0 m) will require supervision by a Class A licensed asbestos contractor. The works will be undertaken using the procedures described in the SWA *Code of Practice How To Safely Remove Asbestos (SWA 2016b)* and the following site-specific procedures:

- All site workers shall be inducted to the site and made aware of the procedures outlined in this LTEMP.
- Workers and visitors to the site area will be made aware of the friable asbestos contamination during site inductions and tool box meetings and only authorised people shall enter the work area, which must contain a perimeter barrier to restrict entry.
- An asbestos work area shall be defined and clearly marked.
- All personnel working within the asbestos work area shall wear P2 (or higher) class half face respirators, disposable gloves and coveralls made from materials which provide adequate protection against fibre penetration whilst completing works and whilst within the asbestos work area.
- A 10 m wide exclusion zone shall be established around the perimeter of the asbestos work area. The dimensions of the exclusion zone may be varied by the person/s with management or control of the workplace, or by the Class A licensed asbestos contractor, if necessary to ensure the day to day operation of the City Park or otherwise significant infrastructure.
- Asbestos warning signs shall be placed surrounding the asbestos work area and at entry/egress points.
- A decontamination area shall be marked out within the asbestos work area for the removal and disposal of PPE before site workers leave the asbestos work area. Personal decontamination must be undertaken each time a site worker leaves the asbestos works

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

area and at the completion of the works. All disposable PPE shall be disposed of as asbestos waste.

- Static air monitoring at a minimum of four locations surrounding each asbestos work area and with consideration to neighbouring receptors shall be undertaken in accordance with the *Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition* [NOHSC: 3003(2005)] for the duration of the work. The monitoring locations shall be assigned by a Licensed Asbestos Assessor (LAA).
- At the completion of the works the capping and marker layer are to be re-instated in accordance with the requirements of this LTEMP. The changes should be detailed in an updated register of site works as included as **Appendix E.**

4.4 Soil Management

Any environmentally impacted soil/fill (including asbestos impacted materials and further inclusive of areas of GCL as removed by excavation works) excavated during deep intrusive works must be securely stockpiled separately from the capping / marker layer material. Capping and marker layer materials should also be separately stockpiled. Stockpiles must be placed on a sealed surface or on plastic sheeting to prevent cross contamination of unsealed surfaces.

Stockpiles must be placed in a secure location onsite and covered if they are to remain for more than 24 hours.

Spoil generated from on-site excavations may be re-used on-site, noting that any material excavated from below the marker layer must be re-used below the marker layer. Capping material cross contaminated with soil from below the marker layer must be re-used below the marker layer.

Alternatively, excavated environmentally impacted soils / materials shall be disposed off-site following appropriate waste classification in accordance with **Section 4.6**.

4.5 Dust Management

During any deep intrusive works that will penetrate the marker layer, excavations and stockpiles of spoil should be kept damp to prevent the generation of dust from these sources. Care should be taken to not over-wet excavations and/or stockpiles such that excess runoff is generated.

4.6 Off-Site Disposal and Waste Management

If any material is to be excavated for off-site disposal it should be classified in accordance with EPA waste classification guidelines (NSW EPA 2014[1]) or guidelines that may be in force at that time. Waste must be managed in accordance with the provisions of the *Protection of the Environment Operations (Waste) Regulation 2014* or successor instruments.

[1] Waste Classification Guidelines, Part 1: Classifying Waste, NSW Environment Protection Authority, November 2014 (EPA 2014)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4.7 Emergency Preparedness and Response

The following procedure will be followed in the event that the capping and marker layer are breached unintentionally such that the underlying environmentally impacted soil is exposed:

- Stop the activity or process that has exposed the impacted soil;
- Assess the hazards associated with the exposure of the impacted material and implement appropriate procedures to address the hazards;
- Repair the capping and marker layers such that the impacted soil is once again isolated beneath the capping / barrier. This shall include replacement of the GCL where the original GCL was caused to be removed;
- Collect and secure any impacted soil that may remain exposed and stockpile securely so that it is protected from casual access;
- Review the activity or process that led to the exposure of the impacted soil and revise procedures or actions accordingly to prevent a reoccurrence;
- Complete an environmental incident/corrective action report in accordance with the current quality procedure; and
- Review and revise the LTEMP to reflect any changes that have to be made to prevent a reoccurrence.

In the event of an emergency, then the following persons / organisations shall be available to provide assistance.

Table 4.1: Emergency Contacts

Person	Organisation	Role	Contact Details

4.8 Building / Dwelling Controls

No buildings / dwellings / indoor spaces as potentially affected by restricted ventilation are to be built within the extent of the site (the extent of encapsulated soils) or otherwise within 30 m of the extent of the encapsulated soils. Reference should be made to **Appendix A** for the surveyed extent of the retained soils.

4.9 Capping Inspections

Routine inspection of the capping integrity shall be conducted at the following times throughout the future operation of the site (**Table 4.2**).

Table 4.2: Capping Inspections

Inspection Time	Inspection Frequency
Following an accidental breach/penetration of the capping or marker layer	Following incident
Following break / repair of capping and/or pavement underlying rail lines	Upon completion
Routine inspection of capping across site	Annually

Records of the inspection shall be retained for a minimum period of four years (**Appendix E**).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5. Health and Safety Management

It is the responsibility of persons with management or control of workplaces at the site to ensure that comprehensive health and safety programmes that comply with the requirements of the WHS Regulation and are appropriate for the activities undertaken at the site are implemented. Given the presence of asbestos at the site, additional protocols and procedures that address the specific hazards posed by the asbestos must be included in the overall health and safety plans implemented.

The only significant exposure pathway that can lead to health effects from asbestos fibres is inhalation of respirable fibres. Consequently, workers who may be exposed to dust that has the potential to contain asbestos fibres must wear appropriate respiratory protection. Furthermore, measures must be taken to ensure that dust or other material that may contain asbestos fibres is not carried out of the work area to areas where breathing protection would not ordinarily be considered a requirement.

Potential risks to other co-occurring contaminants can be similarly managed by precluding the potential exposure of the impacted materials or direct contact to the impacted soils otherwise. And to adopt the additional control as noted in **Section 4.8** to eliminate the potential of vapour intrusion / accumulation within site dwellings. The measures as implemented to control potential asbestos hazards will be similarly effective to control risks from other chemical contaminants as may potentially be present.

With regard to the site, there is a risk that soil underlying the capping and marker layer may release asbestos fibres if disturbed. Consequently, in areas where intrusive works are expected to breach the capping and marker layer, work should be supervised by a person holding a Class A licence who should prepare Job Safety Risk Assessments (JSRA) and Safe Work Method Statements (SWMS) relating to the potential for asbestos to be present. The JSRA and SWMS should be submitted to the Responsible Person, who should ensure that the intrusive works are carried out in accordance with the JSRAs and SWMS and requirements identified in **Sections 3 and 4** of this LTEMP.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6. Revision of the LTEMP

It may, from time to time, be necessary to revise this LTEMP to reflect changes to legislation, changes on site and/or improvements in technologies or knowledge.

Revision of the LTEMP should be undertaken by an appropriately qualified and experienced environmental consultant or Occupational Hygienist. Any amendments to the LTEMP will need to be reviewed by the Auditor. Copies of the revised LTEMP should be distributed to the current site owners, person/s with management or control of the workplace and regular site workers for on-going implementation.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figures

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix A Survey Plans

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix B Photographs

Photo 1 – ????	**Photo 2 – ????**
Photo 3 – ????	**Photo 4 – ????**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Photo 5 – ????	**Photo 6 – ????**
Photo 7 – ????	**Photo 8 – ????**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Photo 9 – ????	**Photo 10 – ????**
Photo 11 – ????	**Photo 12 – ????**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Photo 13 – ????	**Photo 14 – ????**
Photo 15 – ????	**Photo 16 – ????**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix C LTEMP Record of Induction Form

Date	Name	Signature

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Date	Name	Signature

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix D Capping Reinspection Register

DATE	AREA INSPECTED	COMMENTS	INSPECTING COMPANY AND PERSONNEL DETAILS	SITE LTEMP MANAGER SIGNATURE

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

DATE	AREA INSPECTED	COMMENTS	INSPECTING COMPANY AND PERSONNEL DETAILS	SITE LTEMP MANAGER SIGNATURE

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix E Asbestos Related Works Record

DATE	LOCATION OF WORKS	WORKS COMPLETED	ASBESTOS RELATED WORKS COMPLETED BY	CLEARANCE INSPECTION AND CERTIFICATE ISSUED?	ISSUER OF CLEARANCE CERTIFICATE	SITE LTEMP MANAGER SIGNATURE

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

DATE	LOCATION OF WORKS	WORKS COMPLETED	ASBESTOS RELATED WORKS COMPLETED BY	CLEARANCE INSPECTION AND CERTIFICATE ISSUED?	ISSUER OF CLEARANCE CERTIFICATE	SITE LTEMP MANAGER SIGNATURE

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Document Distribution

Rev No.	Copies	Recipient	Date
A	1 x Electronic	Penrith City Council	14 December 2020

Document Status

Rev No.	Author	Reviewer	Approved for Issue		
		Name	Name	Signature	Date
A	Matthew Parkinson	Chris Bielby	Draft in anticipation of future remedial works	Draft for client review	14 December 2020

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix J Site Auditor Advice

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

NSW Site Auditor Scheme

Site Audit Statement

A site audit statement summarises the findings of a site audit. For full details of the site auditor's findings, evaluations and conclusions, refer to the associated site audit report.

This form was approved under the *Contaminated Land Management Act 1997* on 12 October 2017.

For information about completing this form, go to Part IV.

Part I: Site audit identification

Site audit statement no. SAS116

This site audit is a:

☐ ~~statutory audit~~

☑ non-statutory audit

within the meaning of the *Contaminated Land Management Act 1997*.

Site auditor details

(As accredited under the *Contaminated Land Management Act 1997*)

Name	Rebeka Hall
Company	Zoic Environmental Pty Ltd
Address	Suite 1, Level 9, 189 Kent St SYDNEY NSW
	Postcode 2000
Phone	02 9251 8070
Email	rebeka.hall@zoic.com.au

Site details

Address	114-146 Henry Street, 42-50 Station Street and Allen Place Car Park, Penrith
NSW	Postcode 2750

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Property description

(Attach a separate list if several properties are included in the site audit.)

- Lot 1 in DP545587 – 114-116 Henry Street
- Lot 1 in DP113118 – 118-120 Henry Street
- Lot 1 in DP254763 – Henry Street (to the west of Lot 1 in DP113118)
- Lot 1 in DP164798 and Lot 1 in DP252457 – 134-138 Henry Street
- Lot 10 and 11 in DP553665 – 142 Henry Street
- Lot 2 in DP 556075 – 144 Henry Street
- Lot 3 in DP1200790 – 42 to 44 Station Street
- Lot 1 in DP 526304 – 48 to 50 Station Street
- Lot E DP 163176 – 46 Station Street
- Allen Place Car Park, Gaymark Lane and Allen Place (no lot and DP available)

Local government area	Penrith City Council
Area of site (include units, e.g. hectares)	Approx. 1.87ha
Current zoning	Commercial Core (B3) and Public Recreation (RE1)

Regulation and notification

To the best of my knowledge:

☐ ~~**the site is** the subject of a declaration, order, agreement, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*, as follows: (provide the no. if applicable)~~

- ☐ ~~Declaration no.~~
- ☐ ~~Order no.~~
- ☐ ~~Proposal no.~~
- ☐ ~~Notice no.~~

☑ **the site is not** the subject of a declaration, order, proposal or notice under the *Contaminated Land Management Act 1997* or the *Environmentally Hazardous Chemicals Act 1985*.

To the best of my knowledge:

☑ the site **has** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*

☐ ~~the site **has not** been notified to the EPA under section 60 of the *Contaminated Land Management Act 1997*.~~

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Site audit commissioned by

Name	David Elks
Company	Penrith City Council
Address	PO Box 60 Penrith NSW
	Postcode 2751
Phone	02 4732 8123
Email	david.ellks@penrith.city

Contact details for contact person (if different from above)

Name	Tara Braithwaite, Property Projects Officer
Phone	4732 7667
Email	tara.braithwaite@penrith.city

Nature of statutory requirements (not applicable for non-statutory audits)

☐ ~~Requirements under the *Contaminated Land Management Act* 1997 (e.g. management order; please specify, including date of issue)~~

☐ ~~Requirements imposed by an environmental planning instrument (please specify, including date of issue)~~

☐ ~~Development consent requirements under the *Environmental Planning and Assessment Act 1979* (please specify consent authority and date of issue)~~

☐ ~~Requirements under other legislation (please specify, including date of issue)~~

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Purpose of site audit

☐ **A1** To determine land use suitability

Intended uses of the land:

OR

A2 To determine land use suitability subject to compliance with either an active or passive environmental management plan

Intended uses of the land:

OR

(Tick all that apply)

☐ **B1** To determine the nature and extent of contamination

☑ **B2** To determine the appropriateness of:

☐ an investigation plan

☑ a remediation plan

☐ a management plan

☐ **B3** To determine the appropriateness of a **site testing plan** to determine if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*

☐ **B4** To determine the compliance with an approved:

☐ **voluntary management proposal** or

☐ **management order** under the *Contaminated Land Management Act 1997*

☑ **B5** To determine if the land can be made suitable for a particular use (or uses) if the site is remediated or managed in accordance with a specified plan.

Intended uses of the land: Public Park (western portion of site), high density residential apartments and commercial/industrial buildings with a 2 level basement car parking (eastern portion of site), based on conceptual plan as attached to the SAS.

Information sources for site audit

Consultancies which conducted the site investigations and/or remediation:

Geo-Logix and JBS&G

Titles of reports reviewed:

1. Geo-Logix (2016) Preliminary Environmental Site Assessment Report, 134-138 Henry Street Penrith NSW 2750 (Ref: 1601069Rpt01FinalV01_12Aug16).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2. JBS&G (23 June 2017) Human Health Risk Assessment, Shop 3 Gaymark Lane Penrith NSW (Ref: 52372/109468 RevA).
3. JBS&G (9 July 2017) Phase 2 Environmental Site Assessment, 114-146 Henry Street, 42-50 Station Street, and Allen Place Carpark, Penrith NSW (Ref: 52152/104051RevA).
4. JBS&G (28 March 2018) Data Gap Investigation Sampling Analysis and Quality Plan, 114-146 Henry Street, 42-50 Station Street and Allen Place Car Park (Ref: 52372/113024 Rev A).
5. JBS&G (15 January 2019) Basement Vapour Intrusion Assessment, 121 Henry Street Penrith NSW (Ref: JBS&G 55702-119862/L001 121 Henry Street Vapour Intrusion Assessment).
6. JBS&G (5 March 2019) Data Gap Investigation 114 to 146 Henry Street, 42 to 50 Station Street, and Allen Place Car Park (Ref: 52372/113024 Rev 0).
7. JBS&G (5 March 2019) Penrith Central Park Village Overarching Remedial Action Plan 114 to 146 Henry Street, 42 to 50 Station Street, and Allen Place Car Park (Ref: 55073/120362 Rev A).
8. JBS&G (5 March 2019) Environmental Monitoring Plan, 114-146 Henry Street, 42-50 Station Street, and Allen Place Carpark, Penrith NSW (Ref: 55073/110468).

Other information reviewed, including previous site audit reports and statements relating to the site:

Site audit report details

Title Site Audit Report City Park Precinct, 114-146 Henry Street, 42-50 Station Street and Allen Place Car Park, Penrith NSW 2750

Report no. 17124 SAR116 Date 18 April 2019

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Part II: Auditor's findings

Please complete either Section A1, Section A2 or Section B, not more than one section. (Strike out the irrelevant sections.)

- Use **Section A1** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **without the implementation** of an environmental management plan.
- Use **Section A2** where site investigation and/or remediation has been completed and a conclusion can be drawn on the suitability of land uses **with the implementation** of an active or passive environmental management plan.
- Use **Section B** where the audit is to determine:
    - (B1) the nature and extent of contamination, and/or
    - (B2) the appropriateness of an investigation, remediation or management plan[1], and/or
    - (B3) the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or
    - (B4) whether the terms of the approved voluntary management proposal or management order have been complied with, and/or
    - (B5) whether the site can be made suitable for a specified land use (or uses) if the site is remediated or managed in accordance with the implementation of a specified plan.

[1] For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Section A1

I certify that, in my opinion:

The **site is suitable** for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

☐ Residential, including substantial vegetable garden and poultry

☐ Residential, including substantial vegetable garden, excluding poultry

☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry

☐ Day care centre, preschool, primary school

☐ Residential with minimal opportunity for soil access, including units

☐ Secondary school

☐ Park, recreational open space, playing field

☐ Commercial/industrial

☐ Other (please specify):

_____

OR

☐ I certify that, in my opinion, the **site is not suitable** for any use due to the risk of harm from contamination.

Overall comments:

_____

_____

_____

_____

_____

_____

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Section A2

I certify that, in my opinion:

Subject to compliance with the **attached** environmental management plan[2] (EMP), the site is suitable for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

☐ Residential, including substantial vegetable garden and poultry

☐ Residential, including substantial vegetable garden, excluding poultry

☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry

☐ Day care centre, preschool, primary school

☐ Residential with minimal opportunity for soil access, including units

☐ Secondary school

☐ Park, recreational open space, playing field

☐ Commercial/industrial

☐ Other (please specify):

_____

EMP details

Title _____

Author _____

Date _____ No. of pages _____

EMP summary

This EMP (attached) is required to be implemented to address residual contamination on the site.

The EMP: (Tick appropriate box and strike out the other option.)

☐ requires operation and/or maintenance of **active** control systems[3]

☐ requires maintenance of **passive** control systems only[3].

[2] Refer to Part IV for an explanation of an environmental management plan.
[3] Refer to Part IV for definitions of active and passive control systems.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

~~Purpose of the EMP:~~

~~Description of the nature of the residual contamination:~~

~~Summary of the actions required by the EMP:~~

~~How the EMP can reasonably be made to be legally enforceable:~~

~~How there will be appropriate public notification:~~

~~Overall comments:~~

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Section B

Purpose of the plan[4] which is the subject of this audit:

The overarching RAP (JBS& G, 5 March 2019) presents strategies and remedial options to address the identified environmental impact and to render the site suitable for the proposed uses.

The objectives of this RAP are to:

- Provide a summary of historical site assessments and present a conceptual site model (CSM) documenting the known extent of environmental impact at the site and key exposure pathways associated with the proposed development;
- Identify outstanding potential contamination issues which require further assessment prior to the development and implementation of detailed site-specific RWPs;
- Identify the remedial strategy(ies) to be adopted by an assessment of remedial options considering the proposed land use
- Document the procedures and standards to be followed in order to remove the risks posed by contaminated soils, soil vapour and groundwater to make the site suitable for the proposed developme-nt, while ensuring the protection of human health and the surrounding environment.

I certify that, in my opinion:

~~(B1)~~

☐ ~~The nature and extent of the contamination **has** been appropriately determined~~

☐ ~~The nature and extent of the contamination **has not** been appropriately determined~~

AND/OR (B2)

☑ The investigation, remediation or management plan **is** appropriate for the purpose stated above

☐ ~~The investigation, remediation or management plan **is not** appropriate for the purpose stated above~~

~~AND/OR (B3)~~

☐ ~~The site testing plan:~~

☐ ~~**is** appropriate to determine~~

☐ ~~**is not** appropriate to determine~~

~~if groundwater is safe and suitable for its intended use as required by the *Temporary Water Restrictions Order for the Botany Sands Groundwater Resource 2017*~~

~~AND/OR (B4)~~

☐ ~~The terms of the approved voluntary management proposal* or management order** (strike out as appropriate):~~

[4] For simplicity, this statement uses the term 'plan' to refer to both plans and reports.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

~~☐ **have** been complied with~~

~~☐ **have not** been complied with.~~

~~*voluntary management proposal no.~~

~~**management order no.~~

AND/OR (B5)

☑ The site **can be made suitable** for the following uses:

(Tick all appropriate uses and strike out those not applicable.)

~~☐ Residential, including substantial vegetable garden and poultry~~

~~☐ Residential, including substantial vegetable garden, excluding poultry~~

~~☐ Residential with accessible soil, including garden (minimal home-grown produce contributing less than 10% fruit and vegetable intake), excluding poultry~~

~~☐ Day care centre, preschool, primary school~~

☑ Residential with minimal opportunity for soil access, including units

~~☐ Secondary school~~

☑ Park, recreational open space, playing field

☑ Commercial/industrial

~~☐ Other (please specify):~~

If the site is remediated~~/managed*~~ in accordance with the following plan (**attached**):

*Strike out as appropriate

Plan title: Penrith Central Park Village Overarching Remedial Action Plan 114 to 146 Henry Street, 42 to 50 Station Street, and Allen Place Car Park (Ref: 55073/120362 Rev 0)

Plan author JBS&G

Plan date 5 March 2019 No. of pages 124

SUBJECT to compliance with the following condition(s):

1. Data gaps and the closure of unknowns, as described in Section 6.7 and 6.2.3 respectively, as outlined in the JBS&G (5 March 2019) RAP are to be completed as part of early remediation works. Depending on the findings of the additional works, the RAP should be reviewed and amended should contamination be greater than anticipated, if the risk profile for the site changes or if the remedial strategy differs to that outlined in the current RAP.
2. Pre-demolition hazardous material assessment is to be completed prior to demolition of existing buildings.
3. Preparation of site specific Remedial Work Plans (RWP) if remedial works are staged and the soil vapour SAQP for validation of VOC contamination in the vicinity of the former dry cleaner, should be provided to the Auditor for review and endorsement..

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4. Should UPSS and associated infrastructure be encountered at the former service station property (currently occupied by the Rivers retail store), groundwater validation is required to comply with the NSW UPSS Regulation 2008.
5. Future works should address any EPA requirements in regard to further offsite delineation of the chlorinated hydrocarbon groundwater or soil vapour plume if the EPA deems contamination to be significant.
6. A review of potential restriction to beneficial use of groundwater is to be completed post-remediation.
7. Interim environmental monitoring is to be carried out as described in the JBS&G (5 March 2019) interim Environmental Monitoring Plan for Shop 3, 140 Henry Street as per the stated frequency up until demolition and remediation of the site commences to ensure no unacceptable exposure to contaminants of concern within indoor air occur.

Overall comments:

Note: The above land uses are based on the current conceptual development plan as attached to the SAS. Should more sensitive land uses be proposed or change in landuse configuration the environmental data should be reassessed and the endorsed RAP updated as appropriate.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Part III: Auditor's declaration

I am accredited as a site auditor by the NSW Environment Protection Authority (EPA) under the *Contaminated Land Management Act 1997.*

Accreditation no. 0802

I certify that:

- I have completed the site audit free of any conflicts of interest as defined in the *Contaminated Land Management Act 1997,* and
- with due regard to relevant laws and guidelines, I have examined and am familiar with the reports and information referred to in Part I of this site audit, and
- on the basis of inquiries I have made of those individuals immediately responsible for making those reports and obtaining the information referred to in this statement, those reports and that information are, to the best of my knowledge, true, accurate and complete, and
- this statement is, to the best of my knowledge, true, accurate and complete.

I am aware that there are penalties under the *Contaminated Land Management Act 1997* for wilfully making false or misleading statements.

Signed

Date 18 April 2019

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Part IV: Explanatory notes

To be complete, a site audit statement form must be issued with all four parts.

How to complete this form

Part I

Part I identifies the auditor, the site, the purpose of the audit and the information used by the auditor in making the site audit findings.

Part II

Part II contains the auditor's opinion of the suitability of the site for specified uses or of the appropriateness of an investigation, or remediation plan or management plan which may enable a particular use. It sets out succinct and definitive information to assist decision-making about the use or uses of the site or a plan or proposal to manage or remediate the site.

The auditor is to complete either Section A1 or Section A2 or Section B of Part II, **not** more than one section.

Section A1

In Section A1 the auditor may conclude that the land is *suitable* for a specified use or uses OR *not suitable* for any beneficial use due to the risk of harm from contamination.

By certifying that the site is *suitable*, an auditor declares that, at the time of completion of the site audit, no further investigation or remediation or management of the site was needed to render the site fit for the specified use(s). **Conditions must not be** imposed on a Section A1 site audit statement. Auditors may include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section A2

In Section A2 the auditor may conclude that the land is *suitable* for a specified use(s) subject to a condition for implementation of an environmental management plan (EMP).

Environmental management plan

Within the context of contaminated sites management, an EMP (sometimes also called a 'site management plan') means a plan which addresses the integration of environmental mitigation and monitoring measures for soil, groundwater and/or hazardous ground gases throughout an existing or proposed land use. An EMP succinctly describes the nature and location of contamination remaining on site and states what the objectives of the plan are, how contaminants will be managed, who will be responsible for the plan's implementation and over what time frame actions specified in the plan will take place.

By certifying that the site is suitable subject to implementation of an EMP, an auditor declares that, at the time of completion of the site audit, there was sufficient information satisfying guidelines made or approved under the *Contaminated Land Management Act 1997*

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

(CLM Act) to determine that implementation of the EMP was feasible and would enable the specified use(s) of the site and no further investigation or remediation of the site was needed to render the site fit for the specified use(s).

Implementation of an EMP is required to ensure the site remains suitable for the specified use(s). The plan should be legally enforceable: for example, a requirement of a notice under the CLM Act or a development consent condition issued by a planning authority. There should also be appropriate public notification of the plan, e.g. on a certificate issued under s.149 of *the Environmental Planning and Assessment Act 1979*.

Active or passive control systems

Auditors must specify whether the EMP requires operation and/or maintenance of active control systems or requires maintenance of passive control systems only. Active management systems usually incorporate mechanical components and/or require monitoring and, because of this, regular maintenance and inspection are necessary. Most active management systems are applied at sites where if the systems are not implemented an unacceptable risk may occur. Passive management systems usually require minimal management and maintenance and do not usually incorporate mechanical components.

Auditor's comments

Auditors may also include **comments** which are key observations in light of the audit which are not directly related to the suitability of the site for the use(s). These observations may cover aspects relating to the broader environmental context to aid decision-making in relation to the site.

Section B

In Section B the auditor draws conclusions on the nature and extent of contamination, and/or suitability of plans relating to the investigation, remediation or management of the land, and/or the appropriateness of a site testing plan in accordance with the *Temporary Water Restrictions Order for the Botany Sands Groundwater Source 2017*, and/or whether the terms of an approved voluntary management proposal or management order made under the CLM Act have been complied with, and/or whether the site can be made suitable for a specified land use or uses if the site is remediated or managed in accordance with the implementation of a specified plan.

By certifying that a site *can be made suitable* for a use or uses if remediated or managed in accordance with a specified plan, the auditor declares that, at the time the audit was completed, there was sufficient information satisfying guidelines made or approved under the CLM Act to determine that implementation of the plan was feasible and would enable the specified use(s) of the site in the future.

For a site that *can be made suitable*, any **conditions** specified by the auditor in Section B should be limited to minor modifications or additions to the specified plan. However, if the auditor considers that further audits of the site (e.g. to validate remediation) are required, the auditor must note this as a condition in the site audit statement. The condition must not specify an individual auditor, only that further audits are required.

Auditors may also include **comments** which are observations in light of the audit which provide a more complete understanding of the environmental context to aid decision-making in relation to the site.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Part III

In **Part III** the auditor certifies their standing as an accredited auditor under the CLM Act and makes other relevant declarations.

Where to send completed forms

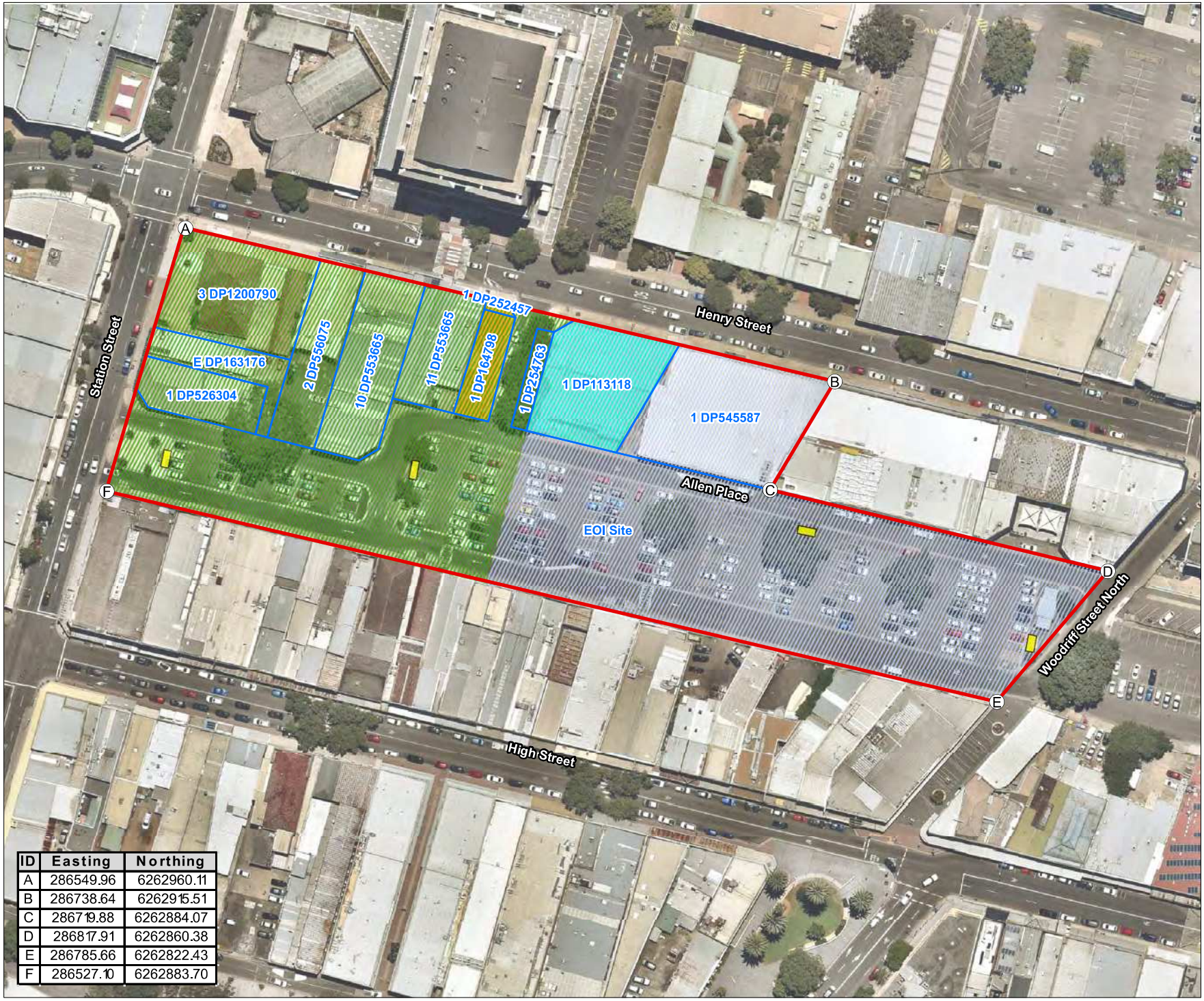
In addition to furnishing a copy of the audit statement to the person(s) who commissioned the site audit, statutory site audit statements must be sent to

- the **NSW Environment Protection Authority**: nswauditors@epa.nsw.gov.au or as specified by the EPA

  AND

- the **local council** for the land which is the subject of the audit.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



ID	Easting	Northing
A	286549.96	6262960.11
B	286738.64	6262915.51
C	286719.88	6262884.07
D	286817.91	6262860.38
E	286785.66	6262822.43
F	286527.10	6262883.70

Reference: Near Map www.nearmap.com, imagery date 20-01-2018

Legend:

- Approximate Site Boundary
- Approximate Lot Boundary
- Dry Cleaners Location
- Former Service Station Location
- Proposed Building Development Site
- Proposed Green Space
- Transformer

Boundary of Site covered by SAS116 dated 18 April 2019 prepared by R Hall of Zoic Environmental Pty Ltd

JBS&G

Job No: 52372

Client: Penrith City Council

Version: R04 Rev 0	Date: 27-Apr-2018
Drawn By: BC	Checked By: RH

Scale 1:1,500

0 10 20
metres

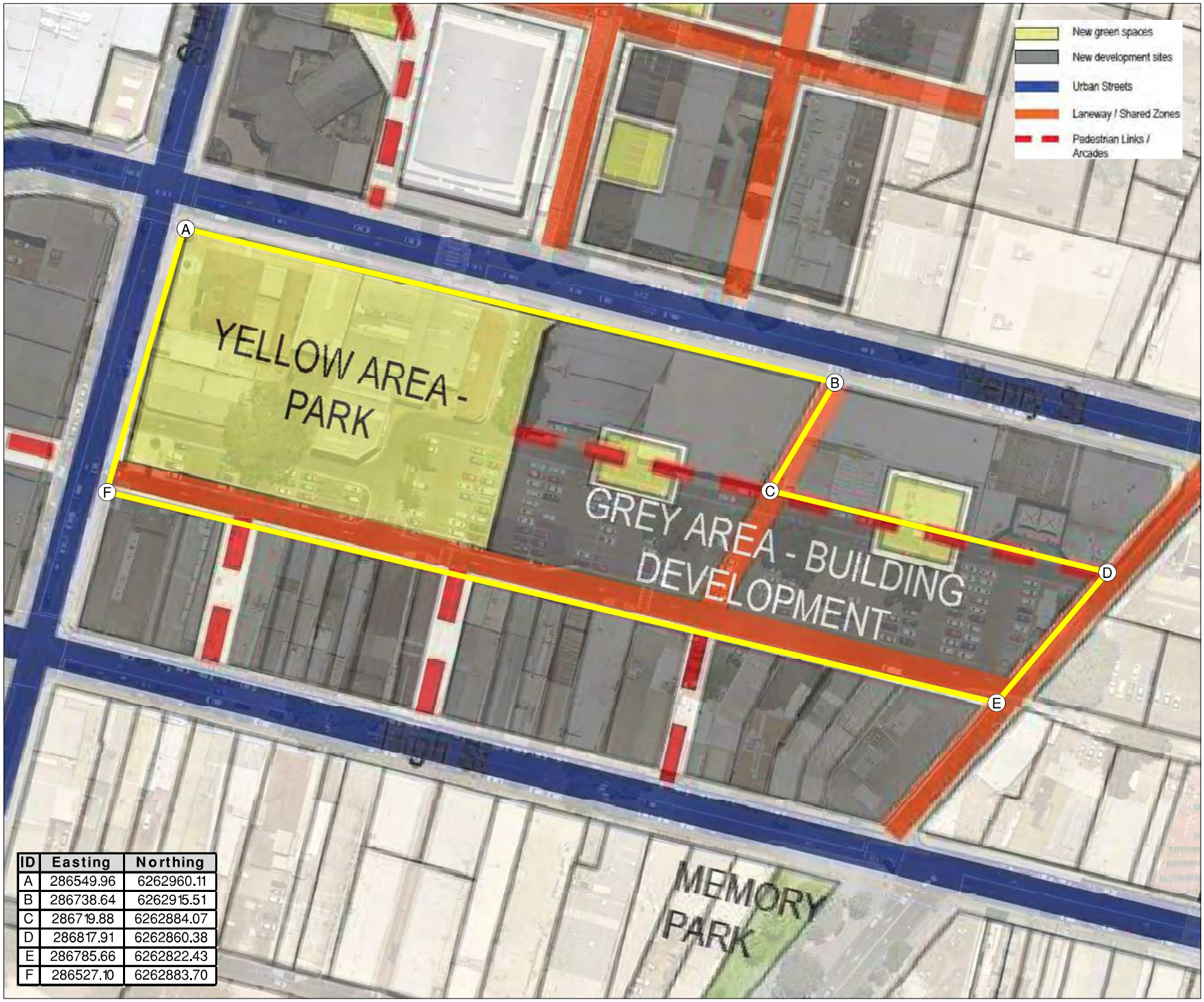
Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

SITE LAYOUT AND CADASTRAL BOUNDARIES

FIGURE 2

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



ID	Easting	Northing
A	286549.96	6262960.11
B	286738.64	6262915.51
C	286719.88	6262884.07
D	286817.91	6262860.38
E	286785.66	6262822.43
F	286527.10	6262883.70

Legend:

Approximate Site Boundary

JBS&G

Job No: 55073

Client: Penrith City Council

Version: R02 Rev A | Date: 16-Nov-2018

Drawn By: AV | Checked By: RH

Scale 1:1,500

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

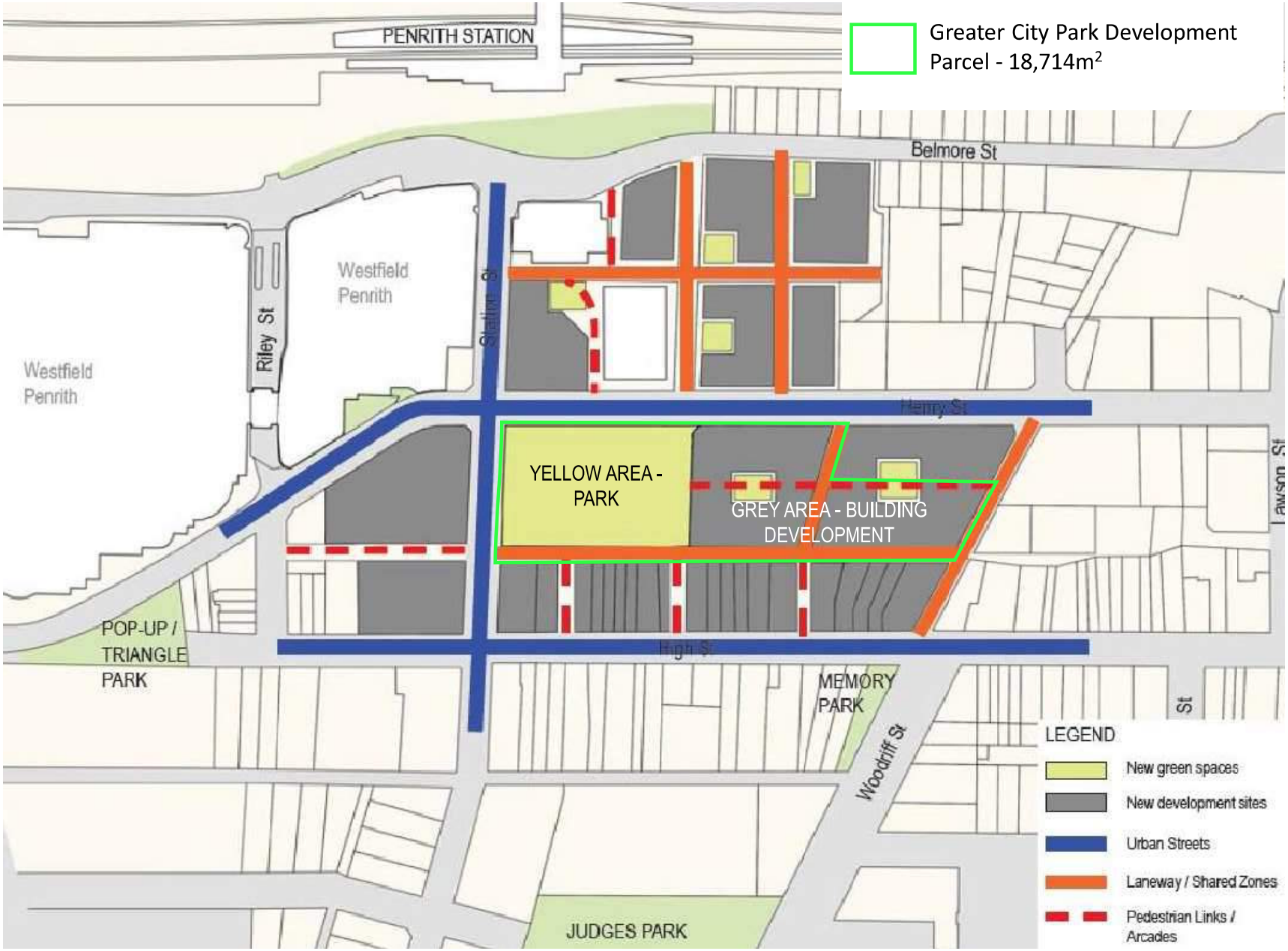
114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

DEVELOPMENT SITE LAYOUT

FIGURE 2

Reference: Near Map www.nearmap.com, imagery date 20-01-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



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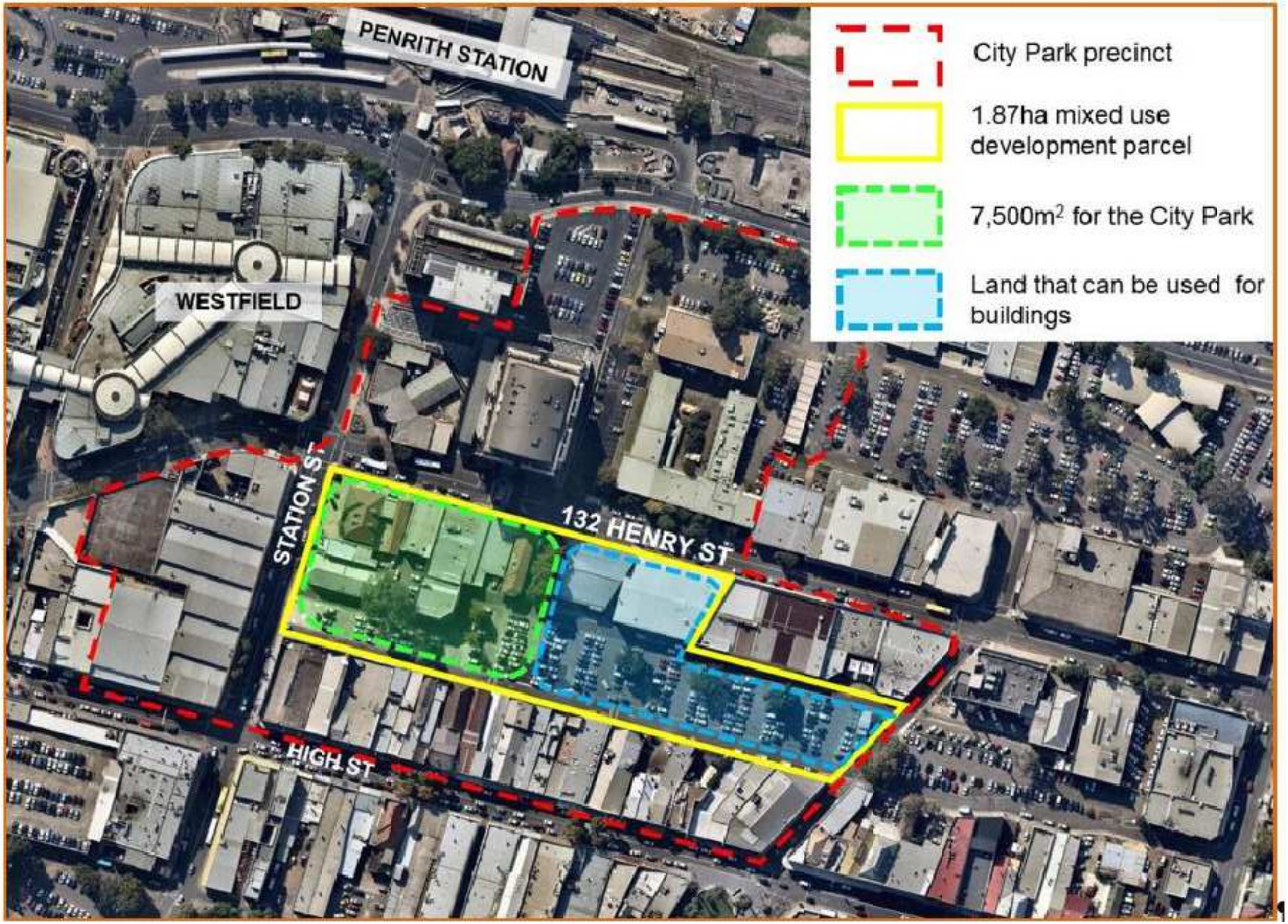

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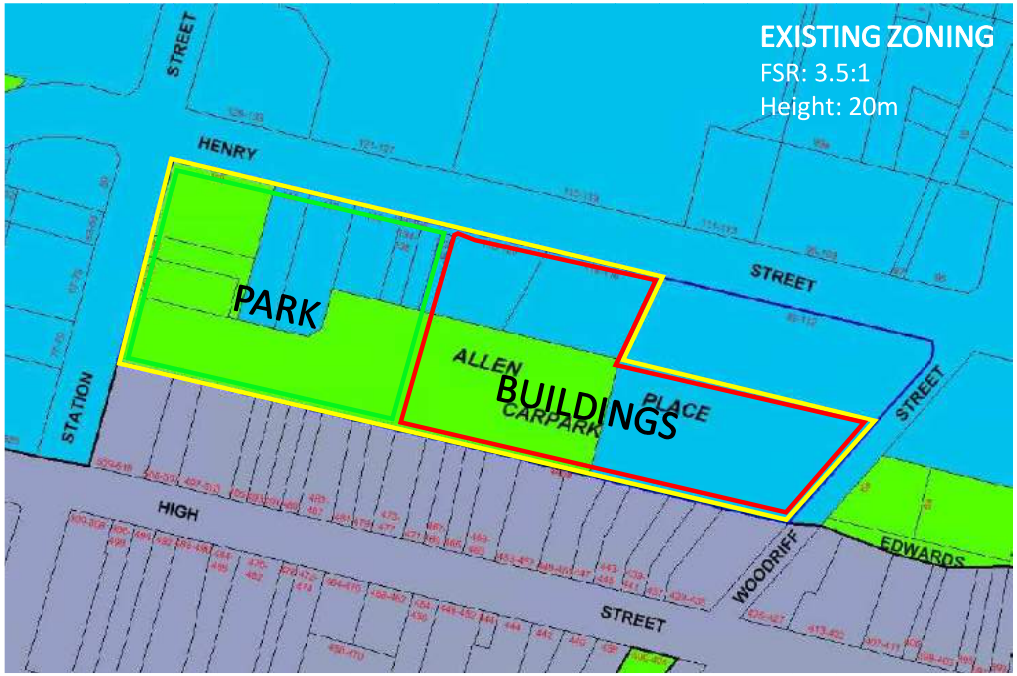
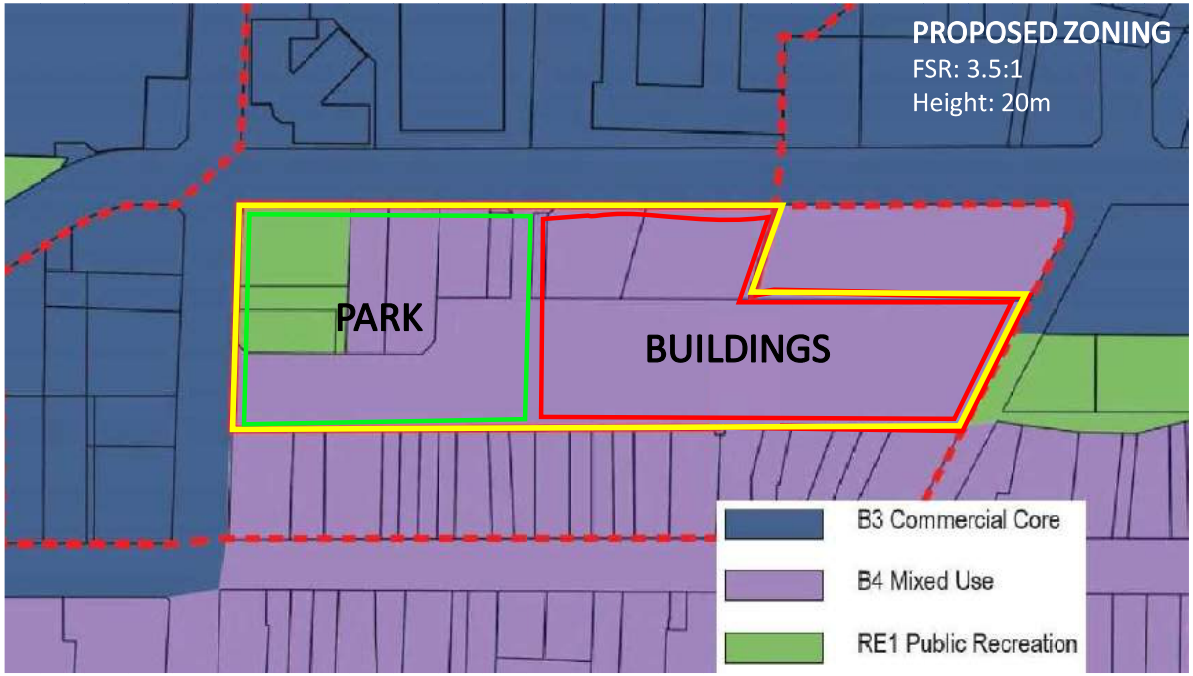
Version: 1, Version Date: 14/04/2021





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Penrith City Council
Penrith Central Park Village
Overarching Remedial Action Plan

114 to 146 Henry Street,
42 to 50 Station Street,
And Allen Place Car Park

5 March 2019

55073/120362 Rev 0

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table of Contents

Abbreviations vii

1. Introduction 1
   - 1.1 Introduction and Background 1
   - 1.2 Objective 2
2. Proposed Development Concept 3
   - 2.1 Background 3
   - 2.2 Building Development Area 3
   - 2.3 Penrith City Park 3
3. Site Condition and Surrounding Environment 4
   - 3.1 Site Identification 4
   - 3.2 Site Description 4
     - 3.2.1 The Dry Cleaner, 134-138 Henry Street, Penrith 5
     - 3.2.2 Shop 3, 140 Henry Street, Penrith 5
   - 3.3 Surrounding Land Use 5
   - 3.4 Topography 6
   - 3.5 Geology and Soils 6
   - 3.6 Salinity 6
   - 3.7 Hydrology 7
   - 3.8 Hydrogeology 7
   - 3.9 Acid Sulfate Soils 7
   - 3.10 Meteorology 8
4. Summary of Site History 9
5. Previous Investigations 10
   - 5.1 Preliminary Environmental Site Assessment Report, Geo-Logix (2016) 10
   - 5.2 Phase 2 Environmental Site Assessment, JBS&G (2017) 10
     - 5.2.1 Introduction 10
     - 5.2.2 Results of the Assessment 11
   - 5.3 Shop 3 Gaymark Lane, Penrith, NSW – Human Health Risk Assessment, JBS&G (2017b) 12
   - 5.4 Data Gap Investigation – Penrith Central Village Park (JBS&G 2018a) 12
6. Conceptual Site Model 14
   - 6.1 Overview 14
   - 6.2 Potentially and Contaminated Media 14
     - 6.2.1 AEC 1 Former Dry Cleaner 15
     - 6.2.2 AEC 2 Former Service Station 17
     - 6.2.3 Additional Issues 18

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.3 Potential for Migration 19
6.4 Potential Exposure Pathways 20
6.4.1 Recreational Public Open Spaces 20
6.4.2 Building Development Areas 20
6.4.3 Offsite Exposure 20
6.5 Receptors 21
6.6 Preferential Pathways 21
6.7 Data Gaps 21
7. Remedial Action Plan 23
7.1 Remedial Goal 23
7.2 Extent of Remediation 23
7.3 Assessment of Remedial Options 23
7.4 Proposed Remedial Approach 30
7.5 Regulatory and Planning Requirements 30
7.6 Remedial Scope of Works 32
7.6.1 Site Establishment 32
7.6.2 Demolition of Overlying Buildings and Current Hardstands 32
7.6.3 Refine Remedial Extents 33
7.6.4 Excavation of Impacted Soils 34
7.6.5 Treatment of Chlorinated and Petroleum Hydrocarbon Impacted Soils 35
7.6.6 Physical Separation 35
7.6.7 Importation and Off-site Disposal of Fill Materials 36
7.6.8 Asbestos Management 36
7.6.9 Movement of Material 37
8. Validation Plan 41
8.1 Overview 41
8.2 State the Problem 41
8.2.1 Identify the Decision 41
8.2.2 Identify Inputs to the Decision? 41
8.2.3 Define the Study Boundaries 42
8.2.4 Develop a Decision Rule 42
8.2.5 Specify Limits of Decision Error 44
8.2.6 Optimise the Design for Obtaining Data 47
8.3 Soil Sampling Methodology 55
8.3.1 Soil Sample Containers 55
8.3.2 PID Screening 55
8.4 Groundwater Sampling Methodology 55

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.5 Soil-vapour Assessment 56
8.5.1 Temporary Soil Vapour Probe and Soil Vapour Well Installation 56
8.5.2 Soil-vapour Sampling 56
8.6 Laboratory Analysis 57
8.7 Validation Criteria....60
8.7.1 Application of Soil Assessment Criteria 66
8.7.2 Material Characterisation for Off-site Disposal 67
8.7.3 Imported Materials 67
8.7.4 Validation of Soil Placement Areas 67
8.8 Reporting....68
8.9 Environmental Management Plan....68
9. Contingency Plan 70
9.1 Unexpected Finds....70
9.1.1 Change in Development Plans 70
9.1.2 Identification of Additional Underground Storage Tank 71
9.1.3 Identification of Oily or Tarry Materials....71
9.1.4 Identification of Chlorinated Hydrocarbon Impact....71
9.1.5 Material Storage Breach 71
9.1.6 Emissions Complaints....71
10. Other Remediation Documents....73
10.1 Remedial Works Plans 73
10.2 Environmental Management 73
10.2.1 Preparation of a Remediation Environmental Management Plan 73
10.2.2 Required Elements/Procedures 73
10.2.3 Certification....75
10.2.4 Hours of Site Operation/Duration of Works 75
10.3 Health and Safety 75
10.3.1 Work Health and Safety Management Plan 75
10.3.2 Additional Site-Specific Elements/Procedures....76
10.3.3 Asbestos 76
10.3.4 Additional Consideration of Chemical Contaminants....76
11. Conclusions and Recommendations....78
11.1 Conclusions....78
11.2 Recommendations 78
12. Limitations 79

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

List of Tables

Table 3.1 Summary Site Details 4
Table 7.1: Remediation Options Assessment Matrix 25
Table 8.1: Summary of Quality Assurance / Quality Control Program 46
Table 8.2 Validation Sample Analytical Frequencies 52
Table 8.3: Soil Laboratory Analysis Methods (all units in mg/kg) 57
Table 8.4: Groundwater Laboratory Analysis Methods (all units in mg/L) 59
Table 8.5: Soil-vapour Laboratory Analysis Methods (all units stated in mg assuming sample volume of >25 L) 59
Table 8.6 Health Based Soil Investigation Criteria and Hydrocarbon Management Limits (all units in mg/kg) 61
Table 8.7 Ecological Investigation and Ecological Screening Levels (all units in mg/kg) 63
Table 8.8 Soil-vapour Health Investigation and Screening Levels (all units in mg/m^3) 64
Figure 9.1 - Unexpected Finds Protocol 72
Table 10.1 Required Elements of the REMP 74

List of Figures

Figure 1 Site Location
Figure 2 Proposed Development Layout
Figure 3 Site Layout and Areas of Environmental Concern
Figure 4A Historical Soil Sample Locations and Tier 1 Exceedances
Figure 4B Groundwater Well Locations, Tier 1 Exceedances and Inferred Groundwater Flow Direction
Figure 4C Soil Vapour Sample Locations and Tier 1 Exceedances
Figure 4D 134-138 and 140 Henry Street Floor Plan and Vapour Sample Locations
Figure 5 Depth of Fill/Fill Thickness
Figure 6 Remedial Extent

Appendices

Appendix A Design Plans
Appendix B EPA Searches
Appendix C Borehole Logs and Monitoring Well Installation Details
Appendix D Materials Tracking

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Abbreviations

Term	Definition
ACM	Asbestos Containing Material
AHD	Australian Height Datum
ASS	Acid Sulfate Soils
bgs	Below Ground Surface
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CEC	Cation Exchange Capacity
COPC	Contaminants of Potential Concern
Council	Penrith City Council
CSM	Conceptual Site Model
DA	Development application
DGI	Data Gap Investigation
DO	Dissolved Oxygen
DP	Deposited Plan
DPI	Department of Primary Industry
DQI	Data Quality Indicator
DQO	Data Quality Objective
EC	Electrical Conductivity
Eh	Redox Potential
EIL	Ecological Investigation Levels
Envirolab	Envirolab Services Pty Ltd
EPA	NSW Environmental Protection Authority
ESA	Environmental Site Assessment
ESL	Ecological Screening Levels
Eurofins	Eurofins MGT
GME	Groundwater Monitoring Event
GPS	Global Positioning Unit
ha	Hectare
HIL	Health Investigation Levels
HSL	Health Screening Levels
JBS&G	JBS&G Australia Pty Ltd
LOR	Limit of Reporting
NATA	National Association of Testing Authorities
OEH	Office of Environment and Heritage
PAH	Polycyclic Aromatic Hydrocarbons
PARCCS	Precision, Accuracy, Representativeness, Comparability, Completeness and Sensitivity
PCB	Polychlorinated Biphenyls
pH	Potential of Hydrogen
PID	Photo-ionisation Detector
ppm	Parts Per Million
QA/QC	Quality Assurance / Quality Control
RAP	Remedial Action Plan
RL	Relative Level
RPD	Relative Percent Difference
SWL	Standing Water Level
RWPs	Remedial Works Plan
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbons
UPSS	Underground Petroleum Storage System
UST	Underground Storage Tank
VOC	Volatile Organic Compounds
VVSAQP	Vapour Validation Sampling Analytical and Quality Plan

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1. Introduction

1.1 Introduction and Background

JBS&G Australia Pty Ltd (JBS&G) has been engaged by Penrith City Council (Penrith, the client) to provide environmental consultancy services associated with the proposed redevelopment of the Penrith City Village Park (PCPV, the site) (**Figure 1**). The site comprises ten (10) legal properties over an approximate area of 1.87 hectares (ha) bound by Station Street, Henry Street, Allen Place and Woodriff Street North, as shown on **Figure 1** and **Figure 2**. The address and legal identification of each property are provided in **Table 3.1**.

The site is currently zoned 'Commercial Core (B3)' and 'Public Recreation (RE1)' (Penrith 2010[1]) and is proposed to be developed for mixed uses including recreational areas and 4 to 6 storey residential apartments with ground floor retail/commercial uses and potential multi-level basements. As part of the rezoning process for the site council requires (in accordance with SEPP55) that it is demonstrated that the site is suitable (or can be made suitable) for the proposed land use.

To facilitate feasibility planning and costing, Council has engaged JBS&G to provide an overarching Remedial Action Plan (RAP), as documented herein. Upon development of detailed design plans, and establishment of project staging, detailed Remedial Works Plans (RWPs) can be prepared to facilitate staged remediation of the site. This RAP is for remediation of the PCPV site redevelopment. Should contamination present in offsite areas require remediation this will be subject to separate RAPs/RWPs.

The site has historically been used for a combination of residential and commercial land uses, including dry-cleaning and retail fuel dispensing, followed more recently by light commercial land uses (retail shops, restaurants, health/wellness services, tutoring services and a funeral parlour). Contamination investigations conducted at the site (Geo-Logix 2016[2], JBS&G 2017[3], JBS&G 2019a[4] and JBS&G (2019b[5]) have identified the presence of elevated volatile organic compounds (VOC) within site media surrounding the former dry-cleaner.

The RAP identifies strategies and remedial options to address the identified environmental impact and render the site suitable for the proposed land use. This RAP has been prepared with reference to relevant Australian Standards and guidelines made or approved by the NSW EPA.

1 *Penrith Local Environmental Plan 2010.* Penrith City Council, Published 11 March 2016, Penrith 2010

2 *Preliminary Environmental Site Assessment Report. 134 – 138 Henry Street Penrith NSW 2750'*, Geo-Logix Pty Ltd, Reference: 1601069Rpt01FinalV01_12Aug16, 12 August 2016, Geo-Logix (2016)

3 *Phase 2 Environmental Site Assessment – 114 to 146 Henry Street, 42 to 50 Station Street and Allen Place Car Park, Penrith, NSW.* JBS&G Australia Pty Ltd, Reference 52372/113034, 9 July 2017, JBS&G (2017);

4 *Data Gap Investigation – 114 to 146 Henry Street, 42 to 50 Station Street and Allen Place Car Park.* JBS&G Australia Pty Ltd, Reference 52372/113024, 15 January 2019, JBS&G (2019a);

5 *Basement Vapour Intrusion Assessment* – 121 Henry Street, Penrith, NSW. JBS&G Australia Pty Ltd dated 15 January 2019, Reference 55702-119862, JBS&G (2019b)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1.2 Objective

The objectives of this RAP are to:

- Provide a summary of historical site assessments and present a conceptual site model (CSM) documenting the known extent of environmental impact at the site and key exposure pathways associated with the proposed development;
- Identify outstanding potential contamination issues which require further assessment prior to the development and implementation of detailed site-specific RWPs;
- Identify the remedial strategy(ies) to be adopted by an assessment of remedial options considering the proposed land use; and
- Document the procedures and standards to be followed in order to remove the risks posed by contaminated soils, soil vapour and groundwater to make the site suitable for the proposed development, while ensuring the protection of human health and the surrounding environment.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2. Proposed Development Concept

2.1 Background

Council has indicated that the site is to be redeveloped into a mixture of public open spaces, and six storey structures comprising a mixture of retail, restaurant, services, entertainment and cultural spaces. The PCPV area is intended to be highly accessible and includes internal shared paths/roads and pedestrian laneways. Preliminary conceptual plans (**Appendix A**) show the current and proposed land uses, the layout of new green spaces, development sites, laneways and pedestrian arcades.

The PCPV provides a range of open spaces including parks and facilities offering places for relaxation, recreation and opportunities for community interaction. The conceptual site layout is shown on **Figure 2**. Council envisages that the western site portion is to be redeveloped into a contemporary public space which creates a focal point for the City Centre and fosters social and economic growth. The balance of the site will comprise development sites to be utilised for residential apartments, laneways, minor green spaces and pedestrian arcades.

2.2 Building Development Area

Preliminary design plans (**Appendix A**) include a mixture of recreational use and 4 to 6 storey residential apartments within the building development area, occupying approximately 11 200 m^2 of the site (**Figure 2**). It is anticipated that bulk excavation to form basements may be required within this portion of the site. The basement is anticipated to occupy a footprint between 13 000 m^2 and 19 000 m^2 and comprise two basement levels. Future landscaped areas (paved extents and/or establishment of flora) within this portion of the site will likely be limited to shallow plantings within constructed garden beds. Laneways and shared paths within the building development area are anticipated to comprise a mixture of concrete, asphaltic and paved hardstands.

2.3 Penrith City Park

Review of the design plans indicate that the Penrith City Park component of the site will comprise a large (approximately 7500 m^2) open recreational space. The park is envisaged to comprise a mixture of paved and grassed areas including shallow/deep planted gardens and potentially raised garden boxes.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3. Site Condition and Surrounding Environment

3.1 Site Identification

The site location is shown on **Figure 1**. The extent of the site and associated cadastral boundaries are shown on **Figure 2**. The site details are summarised in **Table 3.1** and described in detail in the following sections.

Table 3.1 Summary Site Details

Property Identification and Street Addresses	The site is comprised of the following legal properties: • Lot 1 in DP 545587 – 114 to 116 Henry Street • Lot 1 in DP113118 – 118 to 120 Henry Street • Lot 1 in DP 254763 – Henry Street • Lot 1 in DP 164798 – 134 to 138 Henry Street • Lot 10 and 11 in DP 553665 – 142 Henry Street • Lot 2 in DP 556075 – 144 Henry Street • Lot 3 in DP1200790 – 42 to 44 Station Street • Lot 1 in DP 526304 – 48 to 50 Station Street • Lot E in DP 163176 – 46 Station Street In addition, the site area includes the Allen Place Car Park, Gaymark Lane and Allen Place.
Local Government Authority	Penrith City Council
Approximate MGA Coordinates (MGA 56)	As shown on **Figure 2**
Site Zoning	Commercial Core (B3) and Public Recreation (RE1), Penrith (2010)
Current Use	Commercial (car parking, retail, restaurant and services)
Previous Use	Commercial/industrial (car parking, dry cleaning, petroleum dispensing and general retail/services) and residential
Proposed Use	High density residential, public open space and commercial
Site Area	Approximately 1.87 ha

3.2 Site Description

The site was inspected by Rohan Hammond on 3 May 2018.

The site is an irregularly shaped, large commercial precinct bound by the Allen Place loop, Henry Street, Station Street and 98-100 Henry Street. The site area includes the Allen Place car park and ten commercial premises on the southern side of Henry Street in Penrith. The borders of the site were not secured and open to the public (pedestrians and vehicles). The site was utilised for a range of commercial operations at the time of the site investigation including a car park, retail shops and cafes. High pedestrian and vehicular traffic was observed during working hours. All commercial premises at the site were noted to be occupied.

The site generally sloped downward from east to west, with a slight ridge line observed to dissect the centre of the car park. Inspection of site surfaces and comparisons with the surrounding landscape indicated that significant topographical alterations had not occurred.

Approximately 95 % of the ground surfaces were sealed as asphaltic pavement, concrete pathways, and building footprints with onsite drainage channels directing surface water toward the municipal stormwater system. The balance of the site comprised unsealed grounds in the form of garden beds.

Buildings at the site did not exhibit significant indicators of dilapidation, although minor wear, consistent with the age of the buildings was observed. A detailed inspection/hazardous building materials survey of the existing site structures was not undertaken as part of this investigation.

No surface water was present at the site at the time of the investigation. No evidence of waste storage, except for commercial municipal waste bins, or storage tanks were observed at the site. No

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

olfactory indicators of volatile chemical usage, as described in the DSI, were encountered during the recent site inspection. No visual indicators of gross or widespread contamination were observed.

Four transformers were observed: one in the southwest and east corners of the site and two along the northern boundary of the Allen Place Car Park, which were on raised concrete platforms. No hydrocarbon staining was observed to be associated with the transformers. The location of the transformers is shown on **Figure 2.**

3.2.1 The Dry Cleaner, 134-138 Henry Street, Penrith

The former dry cleaner comprised the northern third of the building located at 134-138 Henry Street, Penrith. The shop-front occupied most of the building footprint (>85 %), with the remainder comprising a secluded water closet, storage space and point of sale. The premise was an operational scooter store, occupied by scooters, bikes, helmets and related paraphernalia.

The water closet comprised a small (<3 m^2), fully enclosed space which was serviced by two separate sewerage disposal points. Detergents, household solvents and soaps were observed to be stored within the water closet. The shop-front was serviced by an air exchange (air-conditioning) unit which was observed to be operational during each visit to the premises.

In the alleyway between The Dry Cleaner and Shop 3, numerous services were present. Sewerage infrastructure and stormwater pipes ran in a north to south orientation, connecting stormwater and sewerage pipes to the greater system, south of the premises. Services were noted to comprise a mixture of terracotta and polyvinyl chloride (PVC) pipes.

3.2.2 Shop 3, 140 Henry Street, Penrith

Shop 3 comprised the southern half of the building located at 140 Henry Street, Penrith. The shop was partitioned into four rooms and a water closet, joined by a central hallway. The premises housed an alternative health centre at the time of the investigation.

The shop-front rooms were serviced by air exchange units (air conditioners) which were observed to be in operation during each site visit. The water closet comprised a small (<5 m^2), fully enclosed space which was serviced by two separate sewerage disposal points.

An inspection of the property revealed the presence of household cleaning and medical products: limescale solvents, surface cleaners, stain removers, methylated spirits, polishes, pest control products, ethanol based surface wipes and carpet deodorizers.

3.3 Surrounding Land Use

The current land uses of adjacent properties or properties across adjacent roads are summarised below.

- North – The site is bound to the north by Henry Street and then numerous commercial premises including UFC Gym, Queens of Hearts Community Foundation and Nepean College. Further north is an open carpark and commercial premises on Belmore Street, including Bob Jane T-Marts and Veterinary Hospital;
- East – To the east of the site is Woodriff Street North, followed by commercial premises and Edwards Place carpark. Further east a Pathology Centre and testing laboratory are present;
- South – The is was bound to the south by Allen Place, following which are multiple commercial properties including cafes, a medical centre and pharmacy. Beyond High Street commercial premises are present; and
- West – The site is bound to the west by Station Street, then medium to high density commercial premises. Further to the west is Peach Tree Creek and eventually the Nepean River.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.4 Topography

Review of topographic information obtained from the Spatial Information Exchange Viewer, LPI (2015[6]) regional topographic map indicated that the site surfaces have an elevation of approximately 30 m Australian Height Datum (AHD). The site generally slopes downwards to the west, towards the Nepean River.

Site inspection confirmed that the topography on site was not significantly altered from the natural alignment and sloped slightly downward toward the western boundary, Station Street. A local ridge line existed which dissected the Allen Place Car Park in an approximately west to east alignment, with site surfaces sloping downwards perpendicular to the ridge line.

3.5 Geology and Soils

Reference to the 1:100 000 Geological Series Sheet for Penrith, DMR (1991[7]) indicates that the site is underlain by Bringelly Shale of the Wianamatta Group originating from the Middle Triassic epoch. This unit is comprised of shale, carbonaceous claystone, claystone, laminite, fine to medium-grained lithic sandstone, rare coal and tuff. Bringelly Shale is underlain by Ashfield Shale and, at depth, Hawkesbury Sandstone.

Reference to the 1:100 000 Soil Landscape Series Sheet for Penrith, DMR (1990[8]) indicates that the site is within the Richmond Soil Landscape group. This group of landscape is characterised by quaternary terraces of the Nepean and Georges Rivers. Relatively flat (slopes <1 %) and level. Splays, levees provide local relief of <3 m. Formerly a low open woodland. Richmond soils are poorly structured orange to red clay loams, clays and sands. Texture may increase with depth. Ironstone nodules may be present. Plastic clays in drainage lines, red earths and red podzolic soils occur on terrace surfaces with earthy sands on terrace edges. Limitations of the Richmond group include high erosion hazard on terrace edges and minor localised flooding.

The lithology observed during previous investigations (PSM 2017[9], JBS&G 2017and 2018) is as follows:

- Shallow to moderately deep alluvial soils comprising clay to sandy clay (present from a depth of 0.4 m to 10.5 m below ground surface (bgs));
- Moderately deep to deep alluvial clay to sandy clay mixed with Nepean River gravels (present from a depth of 6.1 m to 13.0 m bgs); then
- Residual shale bedrock (present from a depth of 13.0 m to 15.0 m bgs).

3.6 Salinity

Reference to the Department of Infrastructure, Planning and Natural Resources salinity potential map GS912, DIPNR (2002[10]), has indicated that the site exists within an area of 'moderate salinity potential'.

Vegetation at the site during the site inspection did not exhibit any indicators of salinity related stress.

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6 *'Spatial Information Exchange Viewer'*, NSW Land and Property Information, Accessed 4 January 2018, https://maps.six.nsw.gov.au/;
7 '*Penrith 1:100 000 Geological Series Sheet 9030 (Edition 1)'*. Department of Mineral Resources, 1991, DMR (1991);
8 *'Penrith 1:100 000 Soil Landscape Series Sheet 9030'*. Department of Mineral resources, 1990, DMR (1990);
9 *'Central Park Village, Penrith Geotechnical Investigation*'. Pells Sullivan Meynink, 2017, PSM (2017);
10 *'Salinity Potential In Western Sydney 2002 – GS912'*. Department of Infrastructure, Planning and Natural Resources, March 2003, DIPNR (2002);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.7 Hydrology

Rainfall is considered likely to migrate primarily through surface water runoff into the municipal stormwater system. Minor infiltration into the underlying porous soils and surface is also expected in areas of unsealed ground.

As discussed in **Section 3.2**, the site is largely covered by concrete, asphaltic pavements and building footprints. As such, surface water generated during periods of rainfall is anticipated to primarily enter the municipal stormwater system; via discharge into onsite stormwater catchment infrastructure or alternatively discharge into stormwater pits within the surrounding roadways.

The nearest water body to the Site is Peach Tree Creek, approximately 1.1 km to the west of the site boundary. Peach Tree Creek ultimately contributes to the Nepean River. Municipal stormwater discharges to the Nepean River.

3.8 Hydrogeology

Registered groundwater bore information was obtained from the NSW Department of Primary Industries groundwater mapping tools, NSW DPI (2016[11]). A review of the registered bore information indicated that there were thirteen bores within a 1.5 km radius of the Site. Based on the reported geology, topography and depth to groundwater, groundwater migration is expected to occur in a north-westerly direction, towards Peach Tree Creek approximately 1.2 km away. Groundwater has been reported in the surrounding properties within the river gravels layer. The DGI (JBS&G 2019a) reported groundwater depths ranging from 6.96 m to 8.05 m bgs, flowing in a north-westerly direction.

Registered groundwater bores located within a 1.5 km radius of the site are used for monitoring, recreational and testing purposes. Given the relatively dense urban use of the site and surrounding properties, in addition to the identified licensed bores, there is a moderate probability of additional undocumented bores near the site. No reported utilisation of groundwater as a drinking water source has been reported.

3.9 Acid Sulfate Soils

The Guidelines for the Use of Acid Sulfate Soil Risk Maps, Department of Land and Water Conservation (DLWC) (1997[12]), has indicated that acid sulfate soils (ASS) are likely to be located in coastal lowlands up to about 10 m AHD. No risk map for the area encompassing the site was provided as part of the acid sulfate soil risk map series, DLWC (1998). Review of the geographical and topographical location of the site has indicated that it is a significant distance away from tidal creeks or estuaries, and it is considered unlikely that ASS would exist at the site.

Three Section 149(2&5) planning certificates were obtained for the site, provided in the DSI (JBS&G 2017a). The land was not identified to have been affected by a policy adopted by Council or adopted by any other public authority, notified to Council, that restricts the development of the land because of the likelihood of ASS.

No staining, odours or other indicators of ASS were observed during the DSI or DGI (JBS&G 2017 and 2019a).

[11] NSW Department of Primary Industries, 2015. Groundwater Monitoring Overview Map. Http://allwaterdata.water.nsw.gov.au/water.stm. Accessed 8 November 2016;

[12] '*Guidelines for the use of Acid Sulfate Soil Risk Maps, Edition 2*', 1998, Ref: ISBN 0 7347 5134 6, NSW DLWC (1998);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.10 Meteorology

A review of average climatic data for the nearest Bureau of Meteorology monitoring location (Penrith Lakes[13]) indicates the site is located within the following meteorological setting:

- Average minimum temperatures vary from 5.5 ^{o}C in July to 18.5 ^{o}C in January;
- Average maximum temperatures vary from 17.7 ^{o}C in July to 30.7 ^{o}C in January;
- The average annual rainfall is approximately 728.1 mm with rainfall greater than 1 mm occurring on an average of 71.7 days per year; and
- Monthly rainfall varies from 30.6 mm in September to 121.4 mm in June with the wettest periods occurring on average in January to June.

[13] http://www.bom.gov.au/climate/averages/tables/cw_067113.shtml, Commonwealth of Australia, 2013 Bureau of Meteorology, Product IDCJCM0028 prepared on 1 November 2016 and accessed by JBS&G on 8 November 2016

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4. Summary of Site History

The historical contamination assessments undertaken at the site (Geo-Logix 2016, JBS&G 2017 and 2018) presented a site history review based on the following information sources:

- Section 149(2&5) certificates obtained from council from three representative lots;
- Current and historical land title records;
- Records of stored Dangerous Goods held by WorkCover;
- Historical aerial photographs obtained from the Department of Lands;
- Publicly available heritage records held by the Department of Planning and Environment and Council, where readily available;
- Council Development Application / Building Application (DA/BA) records; and
- Records of environmental incidents, former environmental licences, or contaminated land notices or notifications, available from the EPA.

The site has been used for a range of residential and commercial purposes throughout the period to which records are available. Section 149 (2&5) certificates, historical land title records and aerial photographs indicate that the site comprised primarily low density residential premises from 1881 to 1949, following which it was progressively redeveloped into a commercial precinct.

The commercial precinct included mostly low-risk activities such as restaurants, retail and other services. Two premises were identified to have previously been used for activities with elevated potential to cause contamination of the land:

- Shop 3/134-138 Henry Street, Penrith – dry cleaning services (1977 – 2016); and
- 118-120 Henry Street, Penrith – garage proprietary services (1967 – 1973).

Historical assessments (Geo-Logix 2016, JBS&G 2017 and 2018) have identified contamination within the vicinity of the former dry cleaner (Shop 3/134-138 Henry Street). Following identification of contamination underlying and within the vicinity of the premises, Council notified the NSW EPA of contamination present at Shop 3/134-138 Henry Street.

Subsequently the EPA provided a response to Council (EPA 2018[14]) which made the determination that regulation of the chlorinated hydrocarbon impacts present at Shop 3/134-138 Henry Street under the *Contaminated Land Management Act 1997* was not currently required.

No items of aboriginal or European heritage were identified at the site.

[14] *Former Dry Cleaners – 134-138 Henry Street, Penrith*. NSW Environment Protection Authority Reference DOC17/523668-04

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5. Previous Investigations

The following provides a summary of the information and site characterisation data presented within key assessment reports. These reports include both historical and information relating to investigations conducted at that time.

Comments in relation to contaminants of potential concern (COPC) are provided in the following text in relation to assessment criteria adopted at the time of report preparation.

Sample locations completed during JBS&G (2017 and 2019a) are shown on **Figure 4A** to **4D**. Exceedances of assessment criteria specific to the sample location and to the future proposed land-use of the area are also shown on **Figure 4A** to **4D**. Historical sample results are compared against assessment criteria within **Table A(1), Table A(2), Table B, Table C** and **Table D.**

5.1 Preliminary Environmental Site Assessment Report, Geo-Logix (2016)

Council engaged Geo-Logix Pty Ltd (Geo-Logix) to conduct a preliminary ESA, Geo-Logix (2016) at the property located at 134-138 Henry Street, Penrith, NSW (the preliminary assessment area, Lot 1 DP164798, **Figure 2**). The preliminary assessment was undertaken to assess the potential for contamination to exist at the site given the presence of Shop 3/134-138 Henry Street within the preliminary assessment area.

The preliminary ESA indicated that the site appeared to be vacant until the 1950s. In the period intervening construction of the current building layout and its former vacant use, the site was used for storage of materials. The building layout as observed in the current investigation was constructed during the 1960s and the dry cleaner operated from 1977. Additionally, aerial photographs provided as part of the report indicated that a service station operated from the 1950s to the 1970s (The Service Station, Lot 1 DP113118, **Figure 2**) which was considered to potentially comprise an off-site contamination source for the preliminary assessment area (134-138 Henry Street). It is noted that the historical service station area forms part of the PCPV.

Geo-Logix carried out passive soil vapour assessments at two locations within the dry-cleaning shop. Chlorinated ethenes (CEs) PCE, TCE and DCE were detected in soil vapour samples at concentrations in exceedance of the commercial land-use criteria adopted for the assessment. Additionally, benzene, toluene, ethylbenzene and xylene (BTEX) compounds were detected within the soil vapour at concentrations above the laboratory limit of reporting (LOR) but below the commercial land use criteria. Geo-Logix did not identify onsite migration of contaminants from the former service station as a likely source for these BTEX compounds. The preliminary ESA report identified the presence of potential asbestos containing materials (ACM) forming part of the construction of building within the assessment area.

The site was notified to the EPA by Council following the works undertaken by Geo-Logix in accordance with the *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997* (EPA 2015[15]).

5.2 Phase 2 Environmental Site Assessment, JBS&G (2017)

5.2.1 Introduction

JBS&G was engaged by Council to undertake a DSI at the site. The objective of the DSI was to determine potential for contamination based on current and historical site activities and to draw conclusions regarding the potential contamination status of the site for the proposed land-uses, or make recommendations to enable such conclusions to be made. Consideration was given to the

[15] *'Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*'. NSW Environment Protection Authority, September 2015, EPA 2015;

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

potential for contamination to represent unacceptable risks to future site users based on future land uses proposed under the Central Park Village redevelopment.

The assessment comprised a review of Geo-Logix (2016), the site's environmental setting and historical site activities in conjunction with a field investigation. The field program included inspection, sampling and analysis of soil samples from 28 borehole locations, 3 groundwater samples from monitoring wells installed as part of the program and 10 soil vapour samples collected from sub-slab soil vapour probes. The sampling locations undertaken as part of the DSI, including exceedances of the relevant criteria are shown on **Figure 4A** to **4C**. JBS&G indicated that the presence of buildings and occupied tenancies during the investigation precluded detailed assessment of all site areas.

The site history assessment indicated that the site has been used for a combination of residential and commercial purposes over the period of available records. Historical land title records, obtained for three of the legal properties, indicated that the premises were owned for residential purposes, prior to light commercial use (retail, service station and funeral home facilities). The site was identified to have undergone numerous redevelopments comprising demolition of former structures. Geo-Logics (2016) was reviewed as part of the site history investigation, which indicated the former dry-cleaning operation was a potential source of contamination.

The desktop assessment identified a range of COPCs associated with the following AECs:

- The dry cleaner (Shop 3/134-138 Henry Street, **Figure 3**): improper disposal of dry cleaning chemicals resultant from the operation of the dry cleaner;
- The Service Station (118-120 Henry Street, **Figure 3**): improper management of petroleum hydrocarbons associated with the operation of the former service station;
- Whole of Site: impacts to potential imported fill materials and disturbed/reworked natural materials:
  - Fill materials of unknown origins observed to be present due to site development activities;
  - Pesticide and herbicide application associated with onsite residential maintenance activities within surficial-moderately deep fill and natural soils;
  - Fuel and oil spills associated with onsite residential maintenance activities; and
  - Hazardous building materials associated with existing and former site structures.

5.2.2 Results of the Assessment

Bore and groundwater installation logs are presented in **Appendix C**. The logs indicate that underlying hardstand pavements, fill materials were encountered to depths ranging from 0.2 m and 2.0 m bgs. Fill comprised a combination of silts and clays with varying sand content. Colours were observed to be primarily brown and grey with some orange/yellow clays also encountered. Anthropogenic inclusions were observed within fill material from some locations. Three distinct natural materials were encountered during the investigation: silty/sandy clay which exhibited increasing (although still minor <10 %) sand content with depth (0.2 m – 10.5 m bgs), Nepean River gravels (6.1 m – 13.0 m bgs) and shale bedrock (>11.7 m bgs). No ACM, odours or staining were observed on site surfaces or within the soil profile at any investigation location. No PID readings >1 ppm were reported during field screening for volatile organic compounds during soil sampling.

Sample results from the soil vapour sampling and analyses indicated that CE impacts are present within the vicinity of the dry cleaner. Volatile gas impact extends north of the dry cleaner, along the inferred groundwater flow direction, with exceedances of the soil vapour criteria for PCE and TCE identified from gas samples taken at probe locations SV05 and SV10 (**Figure 4C**). It is noted that the most significant concentrations were detected at location SV05, approximately in line with the

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

inferred groundwater flow direction, and that no exceedances of the site investigation criteria were reported east or south of the dry cleaner.

Contaminants in soils and groundwater were generally not present at concentrations statistically significant and exceeding the site assessment criteria, with the exception of the following:

- Concentrations of PCE (0.059 mg/L) and toluene (0.094 mg/L) in groundwater, collected from location PSM01, were present at concentrations exceeding the adopted drinking water criteria, which was considered to represent a potential unacceptable risk to future onsite receptors.

In addition to the above, exceedances of the laboratory LOR for TRHs were reported in groundwater samples from PSM01, PSM02 and PSM03, the source for which was unclear. The concentrations were not considered representative of a risk to future onsite/offsite receptors.

Groundwater and soil concentrations within the vicinity of the dry cleaner also indicated the presence of CEs, primarily PCE and TCE, albeit at concentrations which were below the adopted site assessment criteria. With respect to the position of the dry cleaner, the inferred groundwater flow direction and the sewer diagrams provided in **Appendix E**, the presence of elevated PCE and TCE within the groundwater sample from PSM01 indicates that CEs may have migrated along the sewerage infrastructure prior to their release into the environment.

5.3 Shop 3 Gaymark Lane, Penrith, NSW – Human Health Risk Assessment, JBS&G (2017b)

JBS&G was engaged by Council to provide an assessment of the potential human health risk to future commercial occupants of the building described as Shop 3 Gaymark Lane, as located in the southern portion of Shop 3/140 Henry Street.

The Human Health Risk Assessment (HHRA) was considered warranted based upon a review of environmental data provided in JBS&G (2017), to determine whether soil, groundwater and/or soil vapour impact reported in JBS&G (2017) posed an unacceptable risk to a proposed future use of the premises for commercial purposes. This has been interpreted as consisting of occupation of the building for commercial activity/durations by adults to assess the risk posed to future occupants of the premises.

The risk assessment considered maximum levels of TCE and PCE recorded in soil vapour in proximity to the premises, and the levels reported adjoining the premises. A sensitivity analysis was undertaken with the risk assessment which found that the estimated levels of risk were considered suitably conservative to premise decision making in relation to objectives stated.

The levels of sub-surface impact were reported to not pose an unacceptable health risk to potential future commercial users of the site. JBS&G stated that there was no potential for aesthetic impacts through recognition of odours associated with the site impact.

5.4 Data Gap Investigation – Penrith Central Village Park (JBS&G 2018a)

JBS&G was engaged to complete a data gap investigation (DGI, JBS&G 2018a) following identification of contamination potentially associated with the former dry cleaner. The DGI comprised targeted soil, groundwater, soil-vapour and indoor air sampling. The DGI reviewed historical DA/BA records for the former dry cleaner and service station. Additionally, sewer service diagrams for the dry cleaner were presented within the report (**Appendix E**).

JBS&G advanced six boreholes within the vicinity of the former dry cleaner (JBMW01 to JBMW05 and SV19). Three boreholes were advanced adjacent to the northern boundary of the site (JBMW02, JBMW05 and SV19), two advanced approximately 50 m west of the dry cleaner and one northeast of the dry cleaner, downgradient of the former service station. Additionally, two boreholes (JBMW06 and JBMW07) were advanced into the property locatd at 48 Belmore Street, approximately 100 m north of the dry cleaner. Selected soil samples were submitted for the following laboratory analysis:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- 8 samples for VOCs;
- 3 samples for PAHs;
- 3 samples for lead;
- 2 samples for fraction organic carbon (Foc); and
- 1 sample for heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn).

Encountered lithological conditions were generally consistent with those reported in JBS&G (2017). Shallow fill was encountered ranging from 0 to 1.2 m bgs, overlying silty and sandy mottled clays (0.4 to 8.9 m bgs), in turn overlying gravelly sandy clay (6.5 m to 12.1 m bgs). Residual shale bedrock was encountered at 11.5 m to 12.1 m bgs at locations JBMW01 to JBMW04.

Seven of the boreholes were converted to groundwater monitoring wells, which were later developed and sampled in addition to previously installed wells (PSM01, PSM02 and PSM03). The groundwater well installation logs are provided as **Appendix D**. Groundwater was sampled over two mobilisations with wells JBMW02 and PSM01 sampled twice. Groundwater samples were analysed for a range of COPCs (VOCs, TRHs and heavy metals).

JBS&G installed 7 sub-slab soil vapour probes surrounding Shop 3/134-138 Henry Street and following sewerage service infrastructure (**Figure 4C**). The sub-slab soil vapour probes were used to access shallow soil vapour. In addition, two boreholes (JBMW05 and SV19) were converted to deep soil vapour wells on the northern side of Henry Street. Soil vapour was sampled via extraction of soil vapours and sorption of VOCs to laboratory prepared carbon tubes. All seven samples were analysed for VOCs.

JBS&G conducted four rounds of indoor air monitoring at 134-138 and 140 Henry Street. Indoor air was sampled at several locations within the shops over 8-hour periods using summa canisters. The indoor air samples were analysed for VOCs. Atmospheric conditions were reported to vary over the sample periods which targeted hot and pressure drop conditions.

Laboratory analytical results are discussed as follows:

- No statistically significant exceedances of the site investigation criteria were reported for COPCs in soils;
- Groundwater concentrations were less than relevant environmental guidance values, with the exception of PCE in JBMW02 (0.15 mg/L) which exceeded the adopted ANZECC (2000[16]) 95 % protection and NHRMC (2017[17]) drinking water criteria;
- CEs were detected in SV11, SV14 and SV16, but were less than the adopted site assessment criteria, with the exception of SV14. PCE (42 mg/m^3) and TCE (2.88 mg/m^3) exceeded the adopted site assessment criteria (HIL-C, NEPM 2013) at location SV14. It is additionally noted that TCE was detected in SV14 at a concentration of 0.168 mg/m^3, exceeding HIL-B and HIL-D criteria.
- Indoor concentrations were generally less than the adopted screening criteria, with the exception of location 140_SHOP (9 April 2018). The concentration of TCE (20 µg/m^3) reported at location 140_SHOP on 9 April 2018 exceeded the adopted indoor air screening criteria.

[16] *Australian and New Zealand Guidelines for Fresh and Marine Water Quality Volume 1.* National Water Quality Management Strategy, Australian and New Zealand Environment and Conservation Council, October 2000, ANZECC (2000);

[17] *National Water Quality management Strategy – Australian Drinking Water Guidelines 6 2011.* National Health and Medical research Council, October 2017, NHMRC (2011);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6. Conceptual Site Model

6.1 Overview

NEPC (2013) identifies a CSM as a representation of site related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The development of a CSM is an essential part of all site assessments.

NEPC (2013) identified the essential elements of a CSM as including:

- Known and potential sources of contamination and contaminants of concern including the mechanism(s) of contamination;
- Potentially affected media (soil, sediment, groundwater, vapours etc.);
- Human and ecological receptors;
- Potential and complete exposure pathways; and
- Any potential preferential pathways for vapour migration (if potential for vapours identified).

6.2 Potentially and Contaminated Media

Areas of environmental concern are shown on **Figure 3**. Potential and known contaminated media comprise:

- Fill materials;
- Underlying natural soils;
- Subsurface vapour and ground gases; and
- Groundwater

Table 6.1 Areas of Environmental Concern and associated Contaminants of Potential Concern

Areas of Environmental Concern (AEC)	Contamination Status	Potentially Contaminated Media	Contaminants of Potential Concern (COPC)
AEC 1 – Former Dry Cleaner 134-138 Henry Street (Lot 1 DP164798) Improper disposal/management of dry-cleaning chemicals	Known	Soil, groundwater, soil-vapour and indoor air	Chlorinated Ethenes (PCE, TCE, DCE)
AEC 2 – Former Service Station 118 Henry Street (Lot 1 DP113118) Potential UPSS and improper management of petroleum hydrocarbons	Potential	Soils	TRHs, PAHs, BTEX and lead
AEC 3 – Transformers Historical spillage/leakage of transformer oils underlying transformers within the Allen Place carpark.	Potential	Soils	TRHs and PCBs
AEC 4 – Fill material Underlying Buildings Fill materials of unknown origin used for site levelling and activities associated with development. Application of COPCs as a result of general maintenance during site occupation (pesticides, herbicides, fuel and oil spills etc).	Potential	soils	Heavy metals, PAHs, TRH, BTEX, OCPs, PCBs, VOCs and asbestos

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.2.1 AEC 1 Former Dry Cleaner

Soil, soil vapour and groundwater samples obtained during the DSI (JBS&G 2017a) and DGI (JBS&G 2019a) indicate that the greatest levels of chlorinated ethene impact is in the immediate vicinity 134-138 Henry Street and extending north and west of the premises. Detections of contaminant concentrations a considerable distance west of the premises provide evidence that the compounds may have migrated along the inferred sewerage infrastructure alignment. Impacts to site media are detailed in **Section 6.2.1.1** to **Section 6.2.1.4**

6.2.1.1 Soil Impacts

Soil samples analysed as part of the previous (JBS&G 2017a) and DGI (JBS&G 2019a) have not identified gross and/or widespread soil contamination. No soil samples analysed within the groundwater table, or nearby to sewerage infrastructure were reported to contain COPCs above the laboratory limit of reporting. Minor concentrations of PCE and TCE at location JHA04, underlying Shop 3/140 Henry Street, were reported in JBS&G (2017a).

Notwithstanding, it is considered likely that soils surrounding the sewerage infrastructure, and underlying the dry cleaner, have historically been impacted by dry cleaning solvents. The maximum levels of TCE reported in sub slab vapour are consistent with a source of chlorinated ethene being present in the unsaturated zone. Chlorinated ethenes can commonly be heterogeneously distributed through a soil profile, and localised within the extent of a sample of soil collected in clay based soils. Due to their characteristics subsurface chlorinated ethene impacted soils are not typically readily identified. Impacted soils are considered to potentially represent an ongoing source of contamination to both groundwater and soil vapour.

6.2.1.2 Groundwater Impacts

Groundwater analytical results indicated that PCE was present at concentrations exceeding the investigation criterion at JBMW02 and JBMW05, and above the laboratory limit of reporting in JBMW03, PSM01 and PSM03. Chlorinated ethenes were not detected in samples of groundwater collected from JBMW01, JBMW04, JBMW06, JBMW07 or PSM02. Trace concentrations of TCE in groundwater were reported at locations JBMW02 (0.002 mg/L to 0.009 mg/L), JBMW05 (0.002 mg/L) and PSM01 (0.001 mg/L).

It is noted that JBMW02 and JBMW05 are over the northern boundary of the site, providing evidence that the impact has migrated off the site via the groundwater. No groundwater monitoring wells have been installed directly into the chlorinated ethene impact source zone, although it is considered likely that the highest concentrations of chlorinated ethenes will be present directly underneath the dry cleaner.

Impacts to groundwater have been delineated north (JBMW06 and JBMW07), east (JBMW03), south (PSM02) and west (JBMW01 and JBMW04). Potential remains for groundwater impact to be present further northwest of JBMW05.

6.2.1.3 Soil vapour Impacts

Shallow Soil Vapour

Results obtained from the DGI (JBS&G 2019a) have shown that significant concentrations of PCE and TCE are present within shallow soil vapour (<0.3 m bgl) surrounding the dry cleaner. Soil vapour contaminant samples collected from locations SV11, SV14 and SV16 were reported to have concentrations of CEs above the laboratory limit of reporting. The highest results reported during the current assessment were associated with location SV14, which was placed immediately overlying sewerage infrastructure servicing the dry cleaner. Soil vapour samples collected from locations SV12, SV13, SV15 and SV17 were not reported to have any VOCs above the laboratory limit of reporting.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Within samples where both TCE and PCE were detected above the laboratory LOR, the ratio of PCE/TCE ranged from 4.143 to 14.49.

The distribution of CEs in soil vapour has provided evidence that the compounds have migrated within/alongside the sewerage infrastructure a considerable distance from the dry cleaner (>50 m). In addition, impacted soil vapour may be migrating over the northern boundary of the site, as indicated by elevated concentrations in SV11.

The investigation results indicate that the occurrence of CEs in shallow soil-vapour is not strongly correlated with presence in groundwater. Whilst volatilisation of CEs from groundwater is likely to be occurring, it is considered unlikely that it is occurring at a level which represents a risk to future site users on the basis of the following considerations.

- SV09 contained no soil vapour concentrations above the laboratory LOR with elevated underlying groundwater impact (PSM01, 0.033 mg/L to 0.059 mg/L);
- The largest groundwater impact (JBMW02) was near two soil-vapour sample locations which were reported to contain minimal concentrations (SV11) to no detection (SV12) of CEs in soil-vapour were present;
- SV16 contained elevated concentrations of CEs with no underlying groundwater impact (JBMW04), and the highest reported soil vapour impact is overlying adjacent to the sewerage infrastructure (SV14); and
- Groundwater is in excess of 7 m below the current ground surface.

Deep Soil Vapour

Two deep soil vapour samples were taken north of the former dry cleaner (SV18 and SV19). Samples were collected from 4.7 m to 5.0 m below ground levels. Highly elevated CEs were detected in both samples, exceeding interim HILs:

- SV18: PCE (367 mg/m^3) and TCE 1.62 (mg/m^3); and
- SV19: PCE (1300 mg/m^3) and TCE 8.83 (mg/m^3).

These results are indicative of the presence of contamination at beneath/adjacent to the former dry cleaners at depth. The relatively low concentrations in groundwater indicate that the deep source is unlikely to be present in the saturated zone. Additional assessment will be required to determine the extent of remediation required to address the presence of elevated CE in deep offsite soil vapour.

6.2.1.4 Indoor Air

Indoor air was sampled over four monitoring events (9 and 17 April 2018, 3 May 2018 and 15 November 2018). Samples analysed from Shop 3/134-138 Henry Street and Shop 3/140 Henry Street have indicated that the PCE is present within the indoor air of both premises. TCE was generally not detected above the laboratory limit of reporting in the analysed samples, with the notable exception of 140_SHOP on 9 April and 3 May 2018. **Table 6.2** and **Table 6.3** show ratios of indoor air to sub-slab vapour concentrations, and relative PCE to TCE concentrations within samples.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 6.2 Indoor Air and Sub-Slab VOC Concentrations

Sample Location	Highest Indoor Air Concentration (µg/m³)	Closest Sub-Slab Soil Vapour Concentration (µg/m³)	Indoor Air to Sub-slab Soil Vapour Ratio
Tetrachloroethene			
140_BATH	<3	14 500 (SV10)	<0.00021
140_SHOP	5	14 500 (SV10)	0.00035
DC_BATH	8	40 000 (SV14)	0.00020
DC_SHOP	8	40 000 (SV14)	0.00020
Trichloroethene			
140_BATH	<2.7	3500 (SV10)	<0.00077
140_SHOP	20	3500 (SV10)	0.00571
DC_BATH	<2.7	2760 (SV14)	<0.00098
DC_SHOP	<2.7	2760 (SV14)	<0.00098

Table 6.3 PCE to TCE Ratio in Site Media

Sample Location	Highest PCE Concentration (µg/m³)	Highest TCE Concentration (µg/m³)	Ratio of PCE/TCE	Approximate Distance From Shop 3/140 Henry Street / Distance From Shop 3/134-138 Henry Street (m)
Indoor Air				
140_BATH	<3	<2.7	-	Internal
140_SHOP	5	20	0.250	Internal
DC_BATH	8	<2.7	>2.963	Internal
DC_SHOP	8	<2.7	>2.963	Internal
Sub-Slab				
SV05	56 667	9333	6.072	<5 / 20
SV10	14 500	3500	4.143	Underlying / 15
SV14	40 000	2760	14.49	Boundary / < 5
SV16	1520	168	9.047	30 / 40

One reported concentration of TCE within indoor air sample 140_SHOP, 9 April 2018 (20 µg/m³), was inconsistent with the subsequent three samples taken at the same location, 17 April 2018 (<2.7 µg/m3),3 May 2018 (5 µg/m³) and 15 November 2018 (<2.7 µg/m³).

The ratio between TCE and PCE in this indoor sample was significantly different to all sub-slab soil vapour samples in which both TCE and PCE were detected. On this basis, the elevated concentration is considered likely to be the result of an additional, internal source within the premises, and is not considered to be reflective of CE advection from the sub-slab soil vapour.

6.2.2 AEC 2 Former Service Station

Environmental samples analysed as part of the site investigations (JBS&G 2017 and 2018) have provided evidence that gross and/or widespread contamination as a result of the former service station operation has not occurred.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Soil samples analysed from JBMW03, JHA04 and JHA06 were reported to have concentrations of TRHs below the adopted site investigation criteria. Soil vapour samples analysed from four locations surrounding the premises were reported to have concentrations of TRHs and BTEX compounds below the laboratory LOR or the site investigation criteria. No TRHs, PAHs or lead in groundwater above the laboratory LOR were reported at JBMW03. If any impacts to soil, groundwater or soil vapour have occurred as a result of the operation of the former service station, it is considered likely that they will be limited to minor, localised hotspots.

6.2.3 Additional Issues

Additional known and potential contamination issues identified are detailed in **Section 6.2.3.1** to **Section 6.2.3.3**.

6.2.3.1 Soil Characterisation

A total of 34 boreholes have been drilled across the site, on a generally systematic grid basis. The boreholes have been skewed as a result of the presence of site structures and to target AECs. Boreholes have provided adequate site coverage to inform site fill characterisation across the majority of the site. Notwithstanding, additional assessment/investigation of soils should be undertaken following removal of buildings to confirm that soil characteristics are consistent with those encountered across the balance of the site.

Fill materials have been reported/encountered across the entire site ranging from 0.15 m to 1.9 m depth. On average, the depth of fill is approximately 0.5 m (**Figure 6**). Fill was generally deeper underlying the commercial properties at the site, and shallower throughout the Allen Place car park. A deeper pocket of fill was identified at JB18 and JB19 terminating at 1.8 m and 1.9 m bgs respectively.

Fill materials are considered to be present due to a combination of historical land use activity and soil importation to establish levels/back fill services. Fill materials were generally identified to comprise a combination of silts and clays with varying sand content. Colours were observed to be primarily brown and grey with some orange/yellow clays also encountered. Anthropogenic inclusions were observed within fill material from some locations.

As presented in the characterisation summary tables (**Table A(1), Table A(2), Table B, Table C** and **Table D**) and **Figure 4A B**, fill materials have been shown to sporadically contain heavy metals (lead, nickel and zinc), TRH/TPH, PAHs, carcinogenic benzo(a)pyrene TEQ equivalent, CEs and asbestos to varying degrees. Statistical analysis of the contaminant data sets for soils, presented in JBS&G (2018), indicate that there are no statistically significant exceedances of the site suitability criteria (**Section 8**).

Identification of asbestos in soils was limited to a single occurrence of asbestos fines in shallow soils at location JB11. The concentration of asbestos was less than the site suitability criteria. It is noted, given the occurrence of anthropogenic inclusions within the fill soil profile, and the historical nature of the site, potential remains for additional asbestos impact within the fill.

Based on data presented in JBS&G (2017 and 2018), contaminant impacts in fill material appear to be associated with identifiable physical characteristics (such as the presence of slag, odours or staining), or underlying discrete point sources (JHA04, former dry cleaner).

With the exception of the above, and impacts discussed in **Section 6.1.1**, soils at the site are considered to be generally free from contamination. No odours, staining or asbestos were observed in any of the historical or current investigation locations. It is noted that the character of soils underlying existing building footprints, and underlying the four onsite transformers, has not yet been determined. Additionally, given the limitation of soil investigations via boreholes, there is the potential for asbestos impacts to be present within fill that have not yet been identified.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.2.3.2 Groundwater Characterisation

JBS&G (2017 and 2018) assessed groundwater conditions within eight wells, six on site (PSM01 to PSM03 and JBMW01, JBMW03, JBMW04), two adjacent to the northern boundary (JBMW02 and JBMW05) and two on 48 Belmore Street (JBMW06 and JBMW07) over three GMEs. Concentrations of COPCs were reported to be generally less than the adopted site assessment criteria, consistent with the absence of substantial contaminant mass in the overlying soils.

Notwithstanding, groundwater within the vicinity of the former dry cleaner has been reported to be impacted by CEs. Elevated concentrations of PCE, exceeding site investigation criteria (ANZAST 2018 and NHMRC 2017), were reported in offsite well JBMW02 and JBMW05, indicating that migration of the contaminants is occurring over the northern boundary via groundwater. The CE impact to groundwater was not detected in wells west of JBMW02 (JBMW01 or JBMW04) at concentrations exceeding site investigation criteria, providing delineation of the extent of significant impact.

JBS&G (2017) reported elevated concentrations TRHs in PSM01, PSM02 and PSM03, as well as elevated toluene in PSM01. Analytical results from later sampling rounds have indicated that these compounds were either not detected above the laboratory LOR or detected at substantially lower concentrations. It is considered that these compounds may have been associated with drilling advancement fluids employed as part of the geotechnical drilling methodology utilised for the installation of these wells.

Analysis of heavy metals within JBMW03 has identified arsenic and nickel at concentrations exceeding the adopted site criteria.

Groundwater at the site has been reported to be saline and unsuitable for use as drinking water. Saline groundwater was reported within the inferred upgradient well (PSM03), indicating that it is the result of background hydrogeological conditions and/or migration on to the site.

6.2.3.3 Soil Vapour and Indoor Air

Except for 134-138 and 140 Henry Street, no potential for soil-vapour or indoor air impact which may represent an unacceptable risk to future site users has been identified within the PCPV site.

6.3 Potential for Migration

Contaminants generally migrate from site via a combination of windblown dusts, rainwater infiltration, groundwater migration and surface water runoff. The potential for contaminants to migrate is a combination of:

- The nature of the contaminants (solid/liquid and mobility characteristics);
- The extent of the contaminants (isolated or widespread);
- The location of the contaminants (surface soils or at depth); and
- The site topography, geology, hydrology and hydrogeology.

The contaminants of concern identified in JBS&G (2017, 2019a and 2019b) are generally in solid (e.g. asbestos, metals and PAHs), liquid (e.g. VOCs, TPH and BTEX) or gaseous (e.g. VOCs, BTEX, Volatile TRH) form.

As the ground surfaces across the site primarily comprise sealed asphalt or concrete pavements and building footprints, the potential for windblown dust migration of contamination is generally low. The potential for contamination migration via surface water movement and infiltration of water and subsequent migration through the soil profile is considered generally to be low given the extent of impermeable pavements across the site.

The underlying natural soils at the site comprise primarily clayey soils and are relatively impermeable. Notwithstanding, CEs have been detected within groundwater (PSM01, JBMW02 and

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBMW05). On this basis, migration of contaminants via groundwater movement has been identified at the site.

Analysis of soil-vapour samples collected from shallow soils show that shallow soil vapour impacts are generally limited to 134-138 and 140 Henry Street. Deep soil-vapour samples collected on the northern side of Henry Street indicate that soil vapour impacts are present at depth beyond the northern site boundary. The scale of the impacts and generally low concentrations in groundwater imply the potential for a deep source of CEs in unsaturated horizons of soil potentially underlying Henry Street. Offsite vapour generation and transport is identified as a migration pathway.

6.4 Potential Exposure Pathways

Based on the COPC identified in various media, as discussed above, and proposed development activities, the exposure pathways for the site during and following development works are discussed below.

6.4.1 Recreational Public Open Spaces

Recreational public open spaces comprise areas which will not be used for building development (**Figure 2**). The following exposure pathways are relevant for site receptors within public open spaces:

- Potential dermal and oral contact to impacted soils as present at shallow depths and/or accessible by future service excavations; and/or
- Potential oral and dermal contact to groundwater as accessible by potential future service installation; and/or
- Inhalation of COPC vapours/gases/fibres migrating upwards from current *in-situ* soils/groundwater; and/or
- Potential contaminant uptake by vegetation proposed to be established in the vegetated areas of the site.

6.4.2 Building Development Areas

Building and development areas are shown on **Figure 2**. The following exposure pathways are relevant for site receptors within building development areas:

- Potential dermal and oral contact to impacted soils as present in areas of accessible soils and/or accessible by future service excavations; and/or
- Potential oral and dermal contact to groundwater as accessible by potential future service installations or potentially intercepted by future basements; and/or
- Inhalation of COPC vapours/gases/fibres migrating upwards or laterally (into basements) from current *in-situ* soils/groundwater; and/or
- Potential contaminant uptake by vegetation proposed to be established in the vegetated areas of the site.

6.4.3 Offsite Exposure

Potential offsite receptors of deep soil vapour impact are identified as basement occupants of 121 Henry Street, Penrith. Potential exposure is through advection of vapours from impacted soils/groundwater into the basement and inhalation by basement occupants. JBS&G (2019b) presents a vapour intrusion assessment, based on current site conditions, which indicates that no unacceptable concentrations of contaminants have been identified in indoor air within the basement of 121 Henry Street.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

The DGI provides a discussion of dilution/attenuation of contaminants within groundwater prior to discharge to the receiving water body (Peach Tree Creek), contaminant uptake by sensitive ecological receptors within the water body is considered not to be a potential exposure pathway which warrants further consideration.

Given the character of the groundwater, and the absence of identified groundwater bores within the vicinity of/downgradient of the site, potential beneficial reuse of the groundwater is not anticipated. Additionally, it is noted that groundwater is present at considerable depth below the current ground surfaces (7 to 8 m bgs). However, it has been conservatively assumed that groundwater may be intercepted by during construction of future basements within the residential/commercial precinct.

6.5 Receptors

Potential receptors of environmental impact present within the site which will require to be addressed include:

- Future occupants and/or site users who may potentially be exposed to COPC through direct contact with impacted soils, groundwater (within basements) and/or inhalation of vapours associated with impacted soils; and/or
- Excavation/construction/maintenance workers conducting activities at or in the vicinity of the site, who may potentially be exposed to COPC through direct contact with impacted soils/groundwater present within excavations and/or inhalation fibres/vapours associated with impacted soils/groundwater; and/or
- Future excavation/construction/maintenance workers who may potentially be exposed to volatile or semi-volatile COPCs through the inhalation of vapours via migration; and/or
- Current and/or future flora at the site who may be exposed to contaminants via direct uptake into root systems.

6.6 Preferential Pathways

For the purpose of this assessment, preferential pathways have been identified as natural and/or man-made pathways that result in the preferential migration of COPC as either liquids or gases.

Natural preferential pathways are likely limited to natural lithological borders, such as between porous soils and bedrock, where infiltrating groundwater is vertically confined and begins to migrate laterally.

Man-made preferential pathways are present throughout the site, generally associated with sub-surface service easements and areas of previously disturbed fill material.

The sewerage infrastructure abutting the western boundary of the former dry cleaner has been identified as a preferential pathway, and is considered likely to have potentially facilitated transport of CEs from the dry cleaner. Preferential pathways can be created by the generally higher permeability fill materials used as backfill to re-instate sub-surface service easements.

6.7 Data Gaps

Potential data gaps include:

- **AEC 1 –** Greater detail on the vertical and lateral distribution of TCE and PCE source material in soils underlying 134-138 and 140 Henry Street as inferred to be causing elevated levels of soil-vapour impact in shallow soils and at depth on the site.

  Where basements are proposed within 30 m of identified impacts, additional assessment of soil-vapour impacts is required to determine whether potential deep vapour impacts represent a risk to future developments;

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- **AEC 2 –** The occurrence of UPSS infrastructure and/or potential localized soil/soil-vapour impacts at 118-120 Henry Street;
- **AEC 3 –** Potential occurrence of impacted oils within shallow soils underlying transformers within the Allen Place Car Park; and
- **AEC 4 –** Potential occurrence of localised areas of asbestos impact and/or dissimilar fill characteristics material underlying current hardstand pavements and building footprints.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7. Remedial Action Plan

7.1 Remedial Goal

The goal for the remediation and/or management of environmental impact is to:

- Remove unacceptable risks to human populations living at/working on/visiting the site posed by impacted site media;
- Remove or manage unacceptable ecological risks to flora/fauna posed by site media;
- Complete remediation work with in accordance with the principles of ecologically sustainable development (ESD)

7.2 Extent of Remediation

Based on the CSM and consideration of the proposed development it is considered that the following scope of remedial works is required for the site:

- AEC 1: A sufficient extent of remediation and/or on-site management of CE impacted soils and local sewerage infrastructure to prevent potential unacceptable exposures to TCE and/or PCE vapours of future occupants of the parkland. This will need to consider potential additional discharge of CEs to groundwater which may result from the removal of current hardstand pavements/coverings. Removal of sewerage infrastructure will be limited to services adjoining 134-138 and 140 Henry Street to the main sewerage infrastructure junction on the southern portion of the two premises (no removal of infrastructure mains is proposed unless substantial additional impacts are identified);
- AEC 2: Potential additional remediation to remove UPSS infrastructure and associated potentially impacted soils, or otherwise manage impacted soils to prevent potential unacceptable risks to future site users (if found to be present during additional assessment, remediation and/or excavation works); and
- AEC3 and 4: Potential additional remediation to remove impacted soils underlying current pavements/buildings/transformers, or otherwise manage impacted soils to prevent potential exposures to asbestos fibres (if found to be present during additional assessment, remediation and/or excavation works).

Characterisation of groundwater undertaken to date has not identified the requirement for groundwater treatment and/or remediation. The source of groundwater impact will be managed as per the above, removing ongoing contribution of COPC. Validation that the groundwater condition remains consistent or improves and does not represent an unacceptable risk to sensitive receptors will be required by the completion of groundwater monitoring and statistical analysis (**Section 8.2.6.7)**.

7.3 Assessment of Remedial Options

The *Contaminated Land Management: Guideline for the NSW Auditor Scheme* (EPA 2017[18]) lists the following order of preference for soil remediation and management:

- On-site treatment of the soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level;
- Off-site treatment of excavated soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site;

[18] *Contaminated Land Management: Guideline for the NSW Site Auditor Scheme (3ed Edition). NSW EPA 2017 (EPA 2017)*

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Removal of contaminated soil to an approved site or facility, followed where necessary by replacement with clean fill; and
- Consolidation and isolation of the soil on-site by containment within a properly designed barrier.

In addition, it is also a requirement that remediation should not proceed in the event that it is likely to cause a greater adverse effect than leaving the site undisturbed. And, where there are large quantities of soil with low levels of contamination, alternative strategies are required to be considered or developed (EPA 2017).

Remedial options have been assessed for the site as detailed in **Table 7.1** following.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 7.1: Remediation Options Assessment Matrix

Remedial Option	Applicability	Assessment
1. On-site treatment so that the contaminants are either destroyed or the associated hazards are reduced to an acceptable level.	AEC 1 – Former Dry Cleaner COPCs: Chlorinated ethenes (PCE, TCE and DCE) All COPCS: **Active *In-Situ* Remediation:** Active remediation of soils/groundwater *in-situ* is achieved by stimulation or injection of biota, or injection of an abiotic reducing agent, which are capable of dechlorinating the COPCs. Bio-remediation of chlorinated ethenes requires reducing conditions which are unable to be readily achieved upon excavation and exposure of soils to atmospheric oxygen. **Passive *In-Situ* Remediation:** Passive remediation of soils/groundwater/soil-vapour *in-situ* is achieved by monitored natural attenuation (MNA). Natural attenuation is governed by physicochemical and biological processes which are native to the relevant aquifer/soils. **Active *Ex-Situ* Remediation:** Active remediation of soils *ex-situ* is achieved by excavation of soils and removal/destruction of COPCs, followed by replacement of soils on the site. Biological destruction of chlorinated ethenes is not readily achieved in oxygen rich environments. Bio-remediation of chlorinated ethenes requires reducing conditions which are unable to be readily achieved upon excavation and exposure of soils to atmospheric oxygen. However implementation of bio-piles may be applicable for removal of VOCs. Bio-piles consist of heaped stockpiles of the soil provided with an internal network of screened piping. Air is extracted from the screened pipe sections, by use of a vacuum pump, or by the use of passive flow devices. Collected air requires treatment/filtration to remove volatile constituents. Fresh air is drawn into the bio-piles over the remainder of the stockpile surface. High concentrations of contaminants, such as anticipated occurrences of phase separated hydrocarbon impact being present on soils, are toxic to the micro-organisms typically preventing effective remediation by bioremediation. Groundwater may be remediated via pump and treat system involving a water treatment plant. Treatment of soils and/or groundwater by highly energy intensive processes such as incineration, washing, pyrolysis and sonic treatment were not assessed given they are not in alignment with the principles of ESD.	AEC 1 COPCs: Chlorinated ethenes (PCE, TCE and DCE) Onsite treatment for removal of chlorinated ethenes is the preferred option where substantial quantities of impacted site media are identified to require treatment under the proposed development scenario. Further detail and discussion is provided below. The success of onsite/offsite treatment is dependent on many factors, including the time available for treatment and soil physicochemical properties. Where onsite/offsite treatment does not reduce COPC concentrations to acceptable levels within reasonable timeframes, Option 3 is the preferred option. All COPCs – The Preferred Option: **Active *In-Situ* Remediation:** Active remediation of *in-situ* media is not a suitable option, given the inferred low hydraulic conductivity of the impacted material which would substantially limit injection of the remediating media (biotic or abiotic). **Passive *In-Situ* Remediation:** Passive remediation via MNA is the preferred option for onsite/offsite impacts where the condition of the site is not proposed to change, and it can be demonstrated that no current/future risk to onsite/offsite receptors is present as a result of the contamination. Where no changes to the existing site condition are proposed, such as underlying the Henry Street road surfaces/footpaths, and it is demonstrated that no ongoing risk to current/future site receptors is present, MNA is the preferred option. Where existing hardstands are to be removed, exposing impacted soils, as is anticipated in the proposed public open spaces, impacted soils will require active remediation prior to implementation of MNA for groundwater/soil-vapour impacts. **Active *Ex-Situ* Remediation:** Remediation of soils by excavation and stripping of VOCs via bio-piles is the preferred option for chlorinated ethene impacted soils. This method will be appropriate for the volatile contaminant impacts where gross hydrocarbon impact is not present, however may not be suitable within clayey soils. The implementation of this method requires consideration of potential time constraints. Bioremediation may be required for extended periods (potentially exceeding six months where soils are fine grained).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Remedial Option	Applicability	Assessment
		Active groundwater treatment is not the preferred option where MNA is able to be implemented per the above. Assessment of energy intensive active treatment technologies has not been completed in detail given they are not in alignment with the principles of ESD.
	AEC 2 – Former Service Station COPCs: TRHs, BTEX, PAHs and Lead No substantial impact to either soil-vapour or groundwater has been identified at the site. Where impacts exist, it is anticipated that they are limited to minor/localised soil hotspots. TRHs and BTEX Given that soil contaminants associated with petroleum storage consist of hydrocarbon constituents, there is a potential that they may be able to be remediated on site by a bioremediation style remediation method. Bioremediation occurs where contaminants are chemically broken-down by the metabolic processes of micro-organisms into less toxic or non-toxic forms. Recent NSW EPA guidance requires bioremediation methods to demonstrate that pollutant emissions are not discharged to the atmosphere. PAHs Polycyclic aromatic hydrocarbons present in site soils are typically restricted to heavier non-volatile constituents. These can be remediated by thermal processes. However, this requires substantial investment in plant and equipment and high energy use. There are a number of microencapsulation treatment technologies which can reduce the mobility of the identified organic contaminants of concern (e.g., cement stabilisation). Lead Metals are unable to be destroyed. However, there are a number of microencapsulation treatment technologies which can reduce the mobility of the identified inorganic contaminants of concern (e.g. cement stabilisation).	AEC 2 COPCs: TRHs, BTEX, PAHs and Lead TRHs and BTEX – The Preferred Option Similar to chlorinated ethenes, TRHs and BTEX compounds are able to be removed from soils by active ex-situ remediation. Bio-piles are the most cost and time effective methodology. Given petroleum products are amenable to aerobic bio-degradation, bio-piles have the secondary benefit of stimulating biological degradation of the products, where identified. Bio-piles are the preferred remedial option where petroleum hydrocarbon impacts to soil are identified. PAHs and Lead – Not a Suitable Option Remediation options are available for PAH contaminated fill contaminants, generally restricted to thermal treatment processes which are energy intensive. These options are not considered consistent with the ESD objectives for the site. Microencapsulation is not considered necessary given the absence of identified groundwater impacts requiring remediation.
	AEC 3 and AEC 4 COPCs: TRHs, PCBs, heavy metals, PAHs, BTEX, OCPs, VOCs and Asbestos	AEC 3 and AEC 4 COPCs: TRHs, PCBs, heavy metals, PAHs, BTEX, OCPs, VOCs and Asbestos

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Remedial Option	Applicability	Assessment
	TRHs, PCBs, OCPs, PAHs and VOCs These compounds are amenable to thermal destruction. Heavy Metals Metals are unable to be destroyed. However, there are a number of microencapsulation treatment technologies which can reduce the mobility of the identified inorganic contaminants of concern (e.g. cement stabilisation). Asbestos There is no known technology to remove asbestos fibres from soils. Asbestos present in non-friable forms can be remediated by screening to remove oversize materials. However, the co-occurrence of a range of construction and demolition materials with the asbestos containing material reduces the potential effectiveness of screening processes. In addition, where asbestos fines impacts have been identified, screening of impacted material increases the risk of exposure to site workers and migration of fibres within the works area.	TRHs, PCBs, OCPs, PAHs and VOCs – Not the Preferred Option The potential quantities of these compounds within AEC 3 and AEC 4 at the site do not warrant the energy and logistical effort required to establish onsite treatment facilities. Further, the energy requirement to facilitate thermal destruction of is not in accordance with the principles of ecologically sustainable development. Heavy Metals – A Potential Option Metals are unable to be destroyed. However, there are a number of microencapsulation treatment technologies which can reduce the mobility of the identified inorganic contaminants of concern (e.g. cement stabilisation). Asbestos – Not a Suitable Option There is no treatment method available for asbestos impacts.
2. Off-site treatment so that the contaminants are either destroyed or the associated hazards are reduced to an acceptable level, after which the soil is returned to the site.	AEC 1 – Former Dry Cleaner COPCs: Chlorinated ethenes (PCE, TCE and DCE) All COPCS: Similar to Option 1, several treatment technologies exist which are capable of removing and/or destroying the COPCs	AEC 1 – Former Dry Cleaner COPCs: Chlorinated ethenes (PCE, TCE and DCE) All COPCs – The Preferred Option: Similar to Option 1 removal of COPCs from site media, and minimization of landfill contributions is the preferred option. Where substantial soil impacts are identified which require treatment, or where other COPCs such as asbestos in soils are identified, this is not a suitable option. AEC 1 to AEC 4 COPCs: TRHs, BTEX, PAHs, Where small quantities of impacted soils require treatment, this is the preferred option. Establishing onsite remediation/treatment facilities carries large establishment costs. However, additional time, energy and costs are incurred to take soils off site and return them to the site.
	AEC 2 – Former Service Station COPCs: TRHs, BTEX, PAHs and Lead	AEC 2 – Former Service Station COPCs: TRHs, BTEX, PAHs and Lead All COPCs: Not the Preferred Option

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Remedial Option	Applicability	Assessment
	No substantial impact to either soil-vapour or groundwater has been identified at the site. Where impacts exist, it is anticipated that they are limited to minor/localised soil hotspots. TRHs, BTEX, PAHs and Lead Similar to Option 1, several treatment technologies exist which are capable of removing and/or destroying the COPCs	The anticipated quantities of impacted soils, comprising minor and/or localised hotspots, does not warrant the logistical and energy investment required to export and reimport soils to the site.
	AEC 3 and AEC 4 COPCs: TRHs, PCBs, heavy metals, PAHs, BTEX, OCPs, VOCs and Asbestos Similar to Option 1, with the exception of Asbestos, these compounds are amenable to treatment.	AEC 3 and 4 COPCs: TRHs, PCBs, heavy metals, PAHs, BTEX, OCPs, VOCs and Asbestos All COPCs: Not the Preferred Option The anticipated quantities of impacted soils, comprising minor and/or localised hotspots, does not warrant the logistical and energy investment required to export and reimport soils to the site.
3. Excavation and off-site removal of the impacted soils.	All COPCs There are currently suitably licensed waste facilities in the Sydney Metropolitan region capable of accepting the identified contaminants.	All COPCs A potentially suitable option but inferior to Option 1, Option 2 and Option 4 where viable. The environmental impact of the transport of materials, waste generation and resource use in sourcing materials to re-instate the site to development levels is considered inconsistent with the principals of ecologically sustainable development. Whilst this method is viable from a technical and practical view point, as a result of resource consumption and waste generation volume considerations, this is not the most preferred remedial option available. However, where materials are identified as not being environmentally suitable under Option 1, Option 2 or Option 4, or surplus to construction requirements then this is the preferred option.
4. On-site *in-situ* management of the soil by physical separation, and ongoing management.	AEC 1 COPCs: Chlorinated ethenes (PCE, TCE and DCE) VOC impacted soils, based on the assessment to date **(Section 5** and **Section 6**), have been inferred to be the source of groundwater and soil-vapour impacts at the site. On this basis, VOC impacted soils are not suitable for retention on the site without treatment such that the VOCs are reduced to an acceptable level.	AEC 1 COPCs: Chlorinated ethenes (PCE, TCE and DCE) Not a suitable option.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Remedial Option	Applicability	Assessment
	AEC 2, AEC 3 and AEC 4 COPCs: TRHs, PAHs, Heavy Metals, OCPs, PCBs, VOCs and Asbestos Volatile COPCs (v-TRH, BTEX and VOCs) Where present, v-TRHs, BTEX and VOCs represent unacceptable migration risks and are not readily encapsulated by onsite retainment technologies. Non-volatile COPCs (sv-TRH, PAHs, heavy metals, OCPs, PCBs and Asbestos) Fill materials, based on the assessment to date (refer to **Section 5** and **6**), have been found to be largely free of constituents at concentrations which pose an unacceptable risk to future site users under the proposed development scenario. Notwithstanding, the potential for these constituents to be present in soils not yet assessed at the site exists. Assessment conducted hitherto has not identified potential impacts in soils: • That will pose a potential groundwater risk by the demonstrated absence of significant groundwater impact attributable to the site; and • That will pose a potential inhalation risk as demonstrated by the assessment of vapours. On this basis, the fill materials potentially contaminated by these compounds are likely to be suitable for retention on the site in areas where direct contact human/ecological exposures can be restricted. Where materials are identified as not being suitable for containment, Option 3 is the preferred remedial strategy.	AEC 2, AEC 3 and AEC 4 COPCs: TRHs, PAHs, Heavy Metals, OCPs, PCBs, VOCs and Asbestos Volatile COPCs (v-TRH, BTEX and VOCs) Not a Suitable Option Non-volatile COPCs (sv-TRH, PAHs, heavy metals, OCPs, PCBs and Asbestos) The preferred option. The retention of the materials will reduce the waste generation and resource requirements of the remediation of the site, as consistent with the ecologically sustainable development. The PCPV will be subject to significant areas of building and pavements which will provide physical separation between site users and retained impacted fill materials if present. This option is of highest ranking with respect to the ecologically sustainable development principles as a result of the low waste volumes and energy use. However, consideration of the practical implications of an ongoing site management is required prior to implementation where impacted materials are proposed to be retained.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.4 Proposed Remedial Approach

As shown in **Table 7.1**, with consideration to EPA (2017) hierarchy for remediation and the principles of ecologically sustainable development the remediation strategy for the proposed development is presented below.

- **AEC 1** – Delineate the extent of impacted soils via soil vapour assessment. Remove all impacted soils and local sewerage infrastructure servicing 134-138 and 140 Henry Street premises. Where onsite treatment is not viable or is unsuccessful, dispose of impacted soils to landfill.

  The anticipated maximum extent of impacted soils within the PCPV site is shown on shown on **Figure 6**. Soil impacts may extent north, into Henry Street, however this is outside of the PCPV project site. Based on the lateral extent occupied by 134-138 and 140 Henry Street, the anticipated maximum extent of VOC impacted soils which remediation is less than 1600 m^3.

- **AEC 2** – Ascertain whether UPSSs exist within 118-120 Henry Street.
  - If UPSSs are identified, remove to a disposal facility, assess surrounding soils to determine whether impacts are present. Excavate impacted soils (if present) and treat on-site. Where onsite treatment is not viable or unsuccessful, dispose of impacted soils to landfill;
  - If impacted soils are identified, excavate impacted soils and treat on site. Where onsite treatment is not viable or unsuccessful, dispose of impacted soils to landfill; and
  - If neither UPSSs or soils are identified, no remediation for AEC 2 required;

  The extent of potentially impacted media within AEC 2 is limited to soils in the vicinity of the UPSS (if present). Gross and/or widespread soil, groundwater and soil-vapour impacts within AEC 2 have not been identified.

- **AEC 3** and **4** – Ascertain whether residual soil impacts exist underlying current buildings/transformers (per **Section 7.6.3**).
  - If impacts are identified, preferentially retain the material onsite under a suitable cap covering to preclude future direct contact by human and ecological site receptors. Where onsite retention is not possible, or redevelopment works result in soils being surplus to development requirements, excavate impacted soils and dispose to landfill;
  - If no residual impacts are identified, no remediation for AEC 3 and AEC 4 is required.

If impacts are identified with AEC 2, AEC 3 or AEC 4 which require onsite retention, the proposed physical separation arrangements, providing physical separation from retained fill are presented in **Sections 7.6.5** (landscaped areas) and **7.6.8** (road reserves/paved areas). Soils moved within the site will require a material tracking system to be implemented during works (as described in **Section 7.6.12**).

If volatile contaminant impacts are identified within any of AEC 2, AEC 3 or AEC 4 during remediation works, potential for the generation of vapours needs to be assessed to determine whether implementation of a 'cap/cover' remedial strategy as indicated in ANZECC (1999), in conjunction with appropriate control measures, is appropriate with respect to management of the health risk.

7.5 Regulatory and Planning Requirements

The following planning requirements for the proposed remedial works are presented.

Environment Planning and Assessment Act 1979/SEPP 55

Under Clause 9 (d) of SEPP 55, remediation work is considered Category 1 remediation work (i.e., requiring development consent) when the development for which another State environmental

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

planning policy or a regional environmental plan requires development consent. The site is located within the boundary of the Sydney Regional Environmental Plan No. 20 – Hawkesbury-Nepean River (No .2 – 1997) (SREP20) and therefore any remediation works require development consent under SREP20. Clause 11 (4) of SREP20 requires consent for remediation.

On this basis, the proposed remedial works at the site are considered to be Category 1 Remedial Works (as per SEPP 55) and require consent.

The nature of remediation works is relatively well understood and it is considered most appropriate that development applications for remediation works are included with DA documentation for the associated earthworks as ancillary to other development. Where development proceeds in stages, which preclude readily completing concurrent remediation and site redevelopment, a separate planning consent may be required to complete remediation of the site.

Environment Planning and Assessment Regulation 2000 – Schedule 3 Designated Development

The proposed remediation works do not constitute designated development. With reference to the triggers listed in Schedule 3, the following commentary is provided:

- Remediation of the site will not comprise treatment or storage of contaminated soil not originating from the site; Remediation will not affect an aggregate area exceeding 3 hectares;
- The proposed remediation works will not incorporate on-site treatment by any means of soil in exceedance of 30 000 m^3; and
- The proposed remediation works will not incorporate treatment by incineration of more than 1000 m^3

Protection of the Environment Operations Act 1997

All potential discharges from the site during remediation works will require to be maintained below applicable assessment criteria/threshold guidelines during the remediation works. This would apply to potential emissions in air, water and discharges to groundwater. Levels of discharges are typically assessed at a site boundary.

The proposed remediation/validation activities are not required to be licensed under the Protection of the *Environment Operation Act (1997)*. The site is less than 3 ha in area, does not store greater than 30 000 m^3 of contaminated fill and hence does not trigger the licensing requirements.

Water Management Act 2000

Should dewatering be required, a dewatering and potentially a re-injection approval will be required from the NSW Department of Primary Industry - Water (DPI-Water) for any dewatering proposed with the site works. The approval will require to be obtained prior to the undertaking of any groundwater dewatering and treatment. Depending on the depth of proposed basements, temporary dewatering may be required.

Protection of the Environment Operations (Waste) Regulation 2014

The regulations make requirements relating to non-licensed waste activities and waste transporting. The proposed works will not require to be licensed. Section 48 of the Reg. requires that wastes are stored in an environmentally safe manner. It also stipulates that vehicles used to transport waste must be covered when loaded. This regulation also details additional tracking requirements for vehicles carrying Special (Asbestos) waste.

Provision is provided in the Regulation and EPA (2014a) guidelines for the NSW EPA to approve the immobilisation of contaminants in waste (if required).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

It is noted that no waste will be received at the site and only VENM, excavated natural material (ENM) or materials covered by a NSW EPA exemption will be imported to the site.

Protection of the Environment Operations (Underground Storage Systems UPSS) Regulation 2014

The removal of UPSSs (if present) will be undertaken in accordance with WorkCover NSW requirements and a validation report will be provided in accordance with the provisions of the *Protection of the Environment Operations (UPSS) Regulation 2014*. The validation process in this RAP meets the requirements of the regulation.

Waste Classification Guidelines (EPA 2014a[19])

All wastes generated and proposed to be disposed off-site shall be assessed, classified and managed in accordance with this guideline. Where wastes require immobilisation prior to off-site disposal (to reduce waste classifications) an immobilisation approval shall be sought in accordance with Part 2 of this guideline. Immobilisations are only anticipated to be required with unexpected finds.

NSW Aquifer Interference Policy (NSW Office of Water 2012)

Groundwater underlying the site will potentially be classified as an aquifer as per the policy. The policy does not apply to the site development as any works proposed to be undertaken within the saturated portion of the site will not contaminate groundwater (as assessed by comparison to applicable standards and guidelines) and will not cause an unacceptable loss of storage or cause structural damage to the aquifer.

Penrith City Council 'Penrith Development Control Plan 2014'

The Council development control plan (DCP) provides a number of environmental and site management provisions required to be employed during remediation works. These have been incorporated into this RAP as minimum standards for the environmental management of remediation works.

Work Health and Safety Act 2017 No 10 and Work Health and Safety Regulation 2017

The information and data provided in this RAP should be considered by the Principal/Remediation Contractor in preparation of their health and safety plans for the remedial works.

7.6 Remedial Scope of Works

It is envisaged that remedial and validation works will be potentially conducted as a staged process as required for the site development. Within each proposed stage, remediation works will comprise, where appropriate the following actions.

7.6.1 Site Establishment

For each stage of remediation works the boundary will be defined (via survey) and secured as appropriate to ensure that all safety and environmental controls are implemented, including necessary contractor briefings and inductions for the remediation workforce. A summary of the controls is provided in **Section 10**.

7.6.2 Demolition of Overlying Buildings and Current Hardstands

Buildings and pavements currently present at the site are anticipated to be demolished to facilitate the proposed development. The demolition will expose underlying impacted soils and areas requiring additional assessment.

[19] Waste Classification Guidelines – Part 1: Classifying Waste. NSW EPA 2014 (EPA 2014a)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Premature exposure of impacted soils within AEC 1 may result in additional recharge (by rainfall or other surface water infiltration) through impacted unsaturated soils. Hardstand pavements overlying AEC 1 will be maintained in reasonable condition until the area is to be remediated.

7.6.3 Refine Remedial Extents

Subsequent to demolition of overlying buildings and hardstand pavements, formerly capped AECs will be exposed and available for additional assessment. The following assessment activities will be undertaken to refine the remedial extent:

- **AEC 1**: Remedial extents for AEC 1 will be refined in accordance with the following program:
  - A Vapour Sampling, Analysis and Quality Plan (VSAQP) will be prepared to inform the requirements of the relevant RWP(s). The VSAQP will stipulate the requirements of a soil-vapour screening assessment on an approximate 5 m grid within the footprint of 134-138 and 140 Henry Street. The soil vapour assessment will be undertaken by installation of temporary multi-level soil vapour probes. Probes will be screened onsite with a compound specific GC-PID, and subsequent confirmatory sampling/analysis using a carbon tube methodology, to determine the extent of impacted soils generating unacceptable concentrations of soil-vapour contamination. The anticipated remedial extent will be informed by trigger levels derived through a development specific risk assessment;
  - Where building development potentially includes multilevel basements, delineation of deep soil-vapour impact extending east of AEC 1. Determination will be made based on the location of proposed basements and relative distance to identified soil-vapour/groundwater impacts and requirements for remediation/management and validation will be included in the relevant RWP(s).
- **AEC 2:** upon demolition of the overlying building at 118-120 Henry Street, assessment for the potential presence of UPSSs will be undertaken. Inspection of the ground surfaces for fill/vent points and scanning with a Ground Penetrating Radar will be undertaken. Fill material will be assessed for the presence of potential petroleum hydrocarbon related impacts by collection and laboratory analysis of samples from four locations across the property as collected via test pit excavation methodology;
- **AEC 3:** Soils underlying current transformers will be assessed by collection/analysis of soil samples. Where no indicators of contamination (staining, odours, free oils, etc.) are identified, one sample is proposed to be analysed from soils with anticipated highest probability of impact underlying each transformer. Should gross indicators of impact be identified, or preliminary results identify contaminated soils, further sampling analysis will be required to determine the extent of impact/remediation. Samples will be assessed for TRHs and PCBs; and
- **AEC 4**: The site fill material has been broadly characterised, however limited site access has precluded assessment of soils underlying current buildings. Soils underlying current buildings will be assessed for the presence of COPCs via test pits. The required number of test pit locations for each building is presented following:
  - Lot 1 DP 526304, Lot E EP 163176, Lot 2 DP 556075 – one location;
  - Lot 11 DP 556665 and Lot 1 DP 164798 – two locations; and
  - Lot 10 DP 553665, Lot 1 DP 113118 and Lot 1 DP 545578 – four locations.

  Test pits will be advanced to a depth of at least 0.5 m into undisturbed natural materials. Soil samples will be collected from fill material analysed for a range of COPCs (**Table 6.1**). Where elevated total soil concentrations are identified, leachate samples will be prepared to determine whether any risk to groundwater is present.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.6.4 Excavation of Impacted Soils

Soils within the footprint of 134-138 and 140 Henry Street and any soils identified as exceeding validation criteria (as derived in the VSAQP or generic criteria presented herein i.e. NEPC (2013)) are required to be excavated and separated from the balance of the site fill materials/natural soils. The inferred extent of the dry-cleaner remediation area is shown on **Figure 6**.

VOC impacted fill material will be refined by future pre-remedial investigation works advised by VSAQP. Upon excavation to the inferred remedial extent, confirmatory field screening and laboratory analysis of soil-vapour will be undertaken to ensure that unacceptable levels of soil-vapour contamination are not present within the residual soils, with risk-based action criteria provided in the VSAQP. Excavated fill materials will be temporarily stockpiled. Stockpiling shall be undertaken to restrict potential environmental emissions in accordance with the requirements of the REMP as discussed in **Section 10**.

The volume of potentially impacted shallow sub-surface soils (based on distance between vapour samples with no HIL-B/HIL-C soil-vapour exceedances, and an average depth of impact of 2 m) is estimated to be 1600 m^3.

Deep soil vapour impact has been identified offsite however the general absence of sub-slab vapour contamination (as evidenced by JBS&G (2019a)) indicates that deep sub-slab vapour contamination is not migrating to the ground surface. Potential migration of vapours back onto the site upon removal of impacted site soils will be considered where basements are proposed per the data gaps discussed in **Section 6.7** and as part of the validation process discussed in **Section 8**.

Petroleum hydrocarbon or other impacted soils (if identified) will be remediated as discussed below or removed from the site to a facility lawfully able to accept the material.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.6.5 Treatment of Chlorinated and Petroleum Hydrocarbon Impacted Soils

Chlorinated ethene impacted soils and, if identified during remedial extent refinement, petroleum hydrocarbon impacted soils shall be treated within the site, where practicable. Treatment will be undertaken by bioremediation and/or compound removal as conducted within biopiles.

Compound removal is completed by stripping chlorinated ethenes from soil surfaces and adsorption of compounds on to an adsorptive media (e.g. activated carbon). Bioremediation is stimulated by increasing oxygen content within the soils to cause aerobic decomposition of petroleum hydrocarbons. Bio-piles will be constructed and operated in a manner that achieves the bioremediation outcomes for the soils while eliminating the potential for environmental emissions. Bio-piles shall be constructed and operated as per the following general specifications:

- Bio-piles shall not exceed 2 m in height;
- Bio-piles shall be provided with screened/slotted piping (i.e. ag line or similar) throughout the stockpiled material. Piping shall be provided at a typical 0.5 m spacing throughout the bio-pile and screened/slotted sections shall be covered by soils within the stockpile;
- Air shall be drawn through the slotted pipes. This causes air to be drawn into the bio-pile and air emissions from the bio-pile (which is anticipated to be malodorous) to be received at a common discharge point; and
- Air emissions shall be filtered through a granular activated carbon (GAC) filter prior to discharge to the atmosphere.

The bio-pile will be covered. The bio-pile will require to be periodically watered to maintain moisture conditions within the soils for bio-remediation. The GAC filter shall be sized on the basis of the size of the bio-pile and observation of emissions from the GAC filter. Where malodorous emissions are observed through the GAC filter, additional filter media shall be required.

Treatments works are required to be undertaken in accordance with *Best Practice Note: Landfarming, NSW, EPA* 2014b. Specific details of the treatment methodology, associated controls and required validation will be provided in relevant RWP(s).

Where the practicality of landfarming is hindered by redevelopment specifics (timing, available space, community objection, etc.) then impacted soils will be disposed of from the site to landfill. Details of the contingency will be provided in the relevant RWP(s).

7.6.6 Physical Separation

If non-leaching/non-volatile soil contamination is identified during remedial extent refinement, the impacted soils will be preferentially retained on site. If the soils are demonstrated as being suitable for retention on site subject to removal of direct contact exposure, then the following procedure will be implemented.

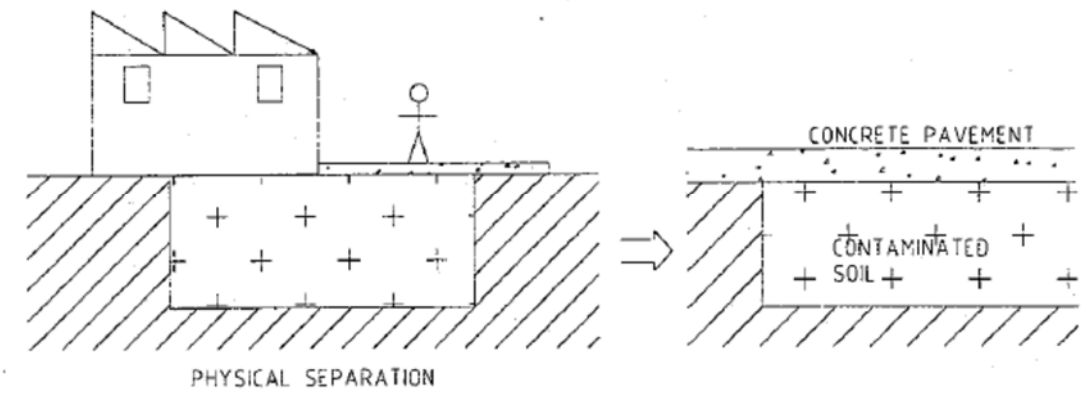
The principal of the on-site management approach within the site is to retain materials in-situ by providing physical separation between impacted fill/soil materials and receptors (e.g. site users, flora or fauna). The management approach prevents direct contact via permanent pavements/minimum soil thickness arrangement (i.e. physical separation), and implementation of a long-term EMP to maintain the physical separation arrangements.

The minimum typical requirements in ANZECC (1999) for physical separation include:

- Permanent concrete floor slab or asphalt surfaced pavement. The pavement outside of the building footprint shall be underlain by a marker layer; or
- A thickness of soil that is unlikely to be penetrated by future users of the site. A minimum soil cover thickness of 0.5 m is nominated as underlain by a layer of ‘marker layer’ in areas of exposed site soil (i.e. landscaped beds and parklands).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

As shown schematically below:



Source: ANZECC (1999)

The marker layer shall consist of orange geofabric. The specific details of the marker layer will require to be included in the validation report and long-term EMP documents in addition to plans showing the extent of capped area within the site.

Material above the marker layer extending to the final finished ground level will be required to be environmentally suitable material for human and/or ecological exposure (as appropriate). These physical separation arrangements shall generally comprise growing media, but may potentially comprise material originating from within the site validated as suitable for reuse in accordance the requirements outlined in **Sections 8**; imported VENM or material certified in accordance with an exemption issued by the NSW EPA. Where materials are proposed for beneficial reuse under a NSW EPA exemption (i.e. imported to the site), fill material will need to be further assessed for land use suitability. Sampling densities and analysis for COPC will be dependent on the volume, material type, source and subject to Site Auditor endorsement and acceptance.

Installation of physical separation arrangements shall be defined by survey as completed by a registered surveyor and/or building as-built drawings sufficient to identify:

- The lateral extent and upper depth height of known environmentally impacted materials (i.e. residual fill materials underlying the cover) within each remediation area/stage;
- The lateral extent and type of cover (e.g. permanent pavement) within the remediation area/stage; and
- Confirmation, by photos or otherwise, of the installation of the 'marker layer' underlying the cover (as required).

A thicker cap may be required in areas of deep planting and/or service installation. Detailed cap construction requirements are required to be provided within relevant RWP(s).

7.6.7 Importation and Off-site Disposal of Fill Materials

Reference should be made to **Section 8** for sampling densities and analytes and compliance with relevant EPA made or endorsed guidelines.

7.6.8 Asbestos Management

Based on the available site characterisation information as discussed in **Section 5**, fill materials within the site have been assessed for the presence of asbestos in soils and have been found to be largely free from asbestos impacts. Notwithstanding, the potential for asbestos impacts to be identified in shallow fill materials upon demolition and removal of overlying hardstands. Given the identification of building and demolition wastes in fill across the site, and the identification of asbestos in soils at location JB11, fill material within the vicinity of this location (as shown on **Figure**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6) is required to be considered as potentially impacted with asbestos fibres, and are provisionally classified as asbestos contaminated soils in accordance with the Work Health and Safety Regulation 2017 until deemed otherwise.

Soil asbestos concentrations are not in exceedance of site suitability criteria, and remediation of soils to remove asbestos impacts is not required for the purpose of making the site suitable for the proposed development. Notwithstanding, management of asbestos is required during development works to ensure that workers and/or offsite receptors are protected.

Asbestos contaminated soil necessitating management for potential asbestos exposure is defined in *How to Manage and Control Asbestos in the Workplace Code of Practice*, 2016, Safe Work Australia/NSW WorkCover 2016 (SWA 2016/NSW WorkCover 2016) as:

- Soil that contains visible asbestos as determined by a competent person; or
- Soil that contains asbestos fibres at quantities exceeding trace levels (considered to be the analytical detection limit in lieu of alternate guidance) as reported by analysis undertaken in accordance with AS4964:2004 *Method for the qualitative identification of asbestos in bulk samples*.

Environmental, health and safety management requirements for the handling of these materials will be based on the requirements provided for asbestos-related works in SWA 2016/NSW WorkCover 2016. This will include preparation of an asbestos register and associated asbestos removal control/management plan as outlined in SWA 20161/NSW WorkCover 2016.

Where sampling and analysis of specific fill materials is completed in conjunction with inspection by a competent person, and the results indicate the material does not fall within the “asbestos contaminated soil” definition, the requirements for management of “asbestos contaminated soils” will not be required to be implemented. The extent of asbestos contaminated soils may be further delineated within a work stage by a similar assessment (i.e. identification of asbestos contamination hotspots).

For the purposes of remediation works within the site, a competent person shall be considered to be a person who holds a tertiary degree in an environmental discipline, has experience in contaminated site assessment and has completed a WorkSafe approved Asbestos Removal Supervisor course.

7.6.9 Movement of Material

Movement of materials will be required at the site and shall be moved as per a material tracking plan as documented following. The tracking system is designed to track the quantity and quality of materials from their arrival on site or their derivation point, through temporary storage to placement.

The system comprises the following elements;

- Definition of Roles and Responsibilities;
- Material quality information;
- Material movement tracking;
- Material emplacement;
- Documentation required;
- Dealing with non-conformance; and
- Dealing with expected and unexpected finds.

7.6.9.1 Roles and Responsibility

The Principal Contractor will be responsible for the following:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Implementation and overall management of onsite procedures and protocols defined in the RAP document.
- Responsible for ensuring all subcontractors and consultants employed in reuse material classification generation, movement and placement are adequately briefed in the requirements of the RAP.
- Will take ultimate responsibility for the movement and placement of materials intended for reuse.
- Will ensure clear lines of communication are maintained between all relevant responsible parties.
- Will be responsible for liaison with suppliers in sourcing of materials from offsite, whether imported VENM or material under a NSW EPA exemption.
- Responsible for ensuring the RAP is operated effectively in conjunction with other relevant documents and in line with the overarching Health, Safety and Environmental Plan, Asbestos Management Plan to be developed for the site.

Environmental Consultant will be responsible for the following:

- Liaise with the Principal Contractor with regards to the importation of materials which does not meet the definition of VENM to ensure materials meet the project requirements and to prevent unsuitable materials being inadvertently brought onto the PCPV, such that the site cannot be validated as suitable for proposed permissible uses.
- Undertake inspections when material importation works are being undertaken to confirm materials sampled are consistent with those being imported.
- Review materials tracking documents submitted by the Principal Contractor and investigate/resolve any discrepancies.
- Cross check inspection findings with materials tracking sheets.
- Provide directives (decisions) relating to a proposed and/or placed fill materials suitability.

7.6.9.2 Material Tracking

The movement of classified materials within the site will be controlled by an appropriately managed Materials Tracking System, as discussed below.

In order to minimize double handling on the site, improve cost effectiveness and reduce environmental impacts, every effort should be made to facilitate the movement of excavated or imported material directly to the area of placement.

It is, however, recognized that this objective may not always be practical and hence the following range of potential material movements is anticipated:

- Stockpile to Placement;
- Import to Emplacement;
- Import to Stockpile;
- Stockpile to Stockpile; and
- Offsite disposal.

7.6.9.3 Materials Characterisation Form

All material movements within the site will be controlled using Materials Classification Forms (MCF) and Material Tracking Sheets (MTS).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Each MCF outlines procedures for confirming material quality, quantity and summarising existing analytical data. The MCF will be completed by the Principal Contractor and/or the Civil Works Contractor and will include the following:

- A unique MCF document name/number;
- A summary of VENM/ENM reports prepared the Environmental Consultant;
- Materials description; and
- Material reuse suitability summary.

Each MCF will be completed and signed off by the Principal Contractor/Civil Works Contractor based on material characterisation reports prepared by Environmental Consultant. Once completed, the MCF will be incorporation into the Principal Contractors materials tracking system prior to placement within the site.

An example of the MCF is presented in **Appendix F**.

7.6.9.4 Materials Tracking Sheet

The MTS is a two-part document which requires information to be collected at the material source location and at one of the three potential destination sites. An example of the MTS is presented in **Appendix D**.

All MTSs will be uniquely referenced and stored as a record of material movements.

This first part (Part A) of the document will record the following data:

i. Time and Date
ii. Truck registration or plant identification;
iii. Load quality; and
iv. MCF reference name/number. The MCF will provide details on items such as a source location reference, visual/olfactory observations, materials classification/reuse zone suitability summary.

The document will also be used for materials required for onsite placement or temporary stored prior to placement and will be completed at the point of unloading. The sheet will record the following details:

- Items i, ii, iii, as above;
- Visual and olfactory observations; and
- Zone of emplacement.

The final portion of the sheet (Part B) will be completed for materials which cannot be used within the site and are scheduled for off-site disposal in accordance with EPA (2014).

Items I, ii, iii and iv above will be recorded initially. The name of the haulage company responsible for transferring the material to the tip site and the details of the receiving site must also be recorded. Prior to leaving the site, the material should have undergone a waste classification in accordance with EPA (2014) and confirmation of this should be acknowledged on the sheet.

Finally, a note should be made of the consignment note number or receipt identification obtained.

The MTS will be reviewed and signed off as completed by the Principal Contractor and or Civil Works Contractor.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.6.9.5 Material Placement

Zones (grid references) of material placement will be accurately surveyed. This will allow the interrogation of the data set to ensure reuse material loads have been correctly deposited and a record kept of cumulative loads deposited in any particular zone.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8. Validation Plan

8.1 Overview

Validation data is required to be collected to verify the effectiveness of the remedial works and document the final site condition as being suitable for the proposed future use(s).

The following sections establish the DQOs to be adopted during validation of the remediation works.

8.2 State the Problem

The site, which has historically been used for commercial/industrial activities, is proposed to be redeveloped for mixed use (residential, public open space and commercial land uses).

Past assessment activities, as summarized in JBS&G (2017 and 2019a) and **Sections 5** to **7**, have identified that, prior to redevelopment, remediation of contamination is required.

During remediation activities, sufficient validation data is required to demonstrate that the identified environmental and health risks to future user(s) of the site have been adequately managed to render the site suitable for the proposed land use.

8.2.1 Identify the Decision

The decisions which are required to be made for validation of the site are:

- Have all VOC impacted soils representing a potential unacceptable human health/ecological risk been successfully treated/removed from the site?
- Where assessment of AEC 2 (former service station), AEC 3 (transformers) and AEC 4 (fill material) have identified residual, localised contamination:
  - Has all petroleum infrastructure and associated contaminated soils representing a potential unacceptable human health/ecological risk under the proposed development scenario been successfully treated/removed from the site?
  - Has all contaminated fill material which represents a potential unacceptable human health/ecological risk with respect to the proposed development scenario been successfully treated/removed from the site?
- Where impacted material which is demonstrated as being environmentally suitable for retention on site under a cap/cover physical separation, have marker layer and physical separation arrangements been installed appropriately and in accordance with RAP requirements?
- Are accessible soils ecologically suitable?
- Are imported soils (where required) ecologically suitable for their proposed use?
- Are offsite concentrations of chlorinated ethenes in groundwater stable or decreasing?
- Is an EMP required to address management of any residual contamination?
- Is the site suitable for the proposed use?

8.2.2 Identify Inputs to the Decision?

Inputs to the decisions are:

- All available site characterisation data collected up to the completion of site validation.
- Field observations in relation to inspection of all excavation bases, walls and stockpiles for odours, sheen, discolouration, and other indicators of potential contamination;
- Ground Penetrating Radar (GPR) survey information;

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Soil and soil-vapour validation analysis data collected from stockpiles and the base and walls of remedial excavations;
- Groundwater validation analytical data collected from monitoring wells installed within and nearby to the site;
- Waste classification and/or material characterisation data obtained during assessment of fill materials/soils;
- Materials tracking records;
- Importation characterisation assessments;
- Disposal dockets and relevant documents in relation to appropriate disposal of material to be removed from site as part of the remediation works (landfill dockets, tank destruction certificates, beneficial reuse/recycling dockets, etc.);
- Survey data in areas of fill retention;
- Survey data as to the extent and thickness of physical separation arrangements and extent of environmentally impacted materials; and
- Data quality indicators as assessed by quality assurance/quality control (QA/QC).

Specifically, sufficient data needs to be collected from each of the identified potentially impacted media (e.g. soils, groundwater and soil-vapour) across the site to demonstrate that the associated COPCs (**Section 7**) have been removed or reduced to an acceptable level.

8.2.3 Define the Study Boundaries

The site comprises 10 legal properties (**Table 3.1**) and occupies an area of approximately 1.87 ha as shown on **Figures 1** to **4**. The study boundary extends north of the site, the final extent of which will be subject to future assessment works, to determine potential offsite migration of impacts. The surrounding land uses of the site is bound by Henry Street, Allen Place, Station Street and Woodriff Street North.

The vertical extent of the works will be the maximum depth from which impacted soils will be excavated/treated.

Validation works will be completed within development timelines to be informed upon development of detailed design proposals.

8.2.4 Develop a Decision Rule

Decision rules are provided following for each of the decisions:

- Have all chlorinated ethene impacted soils representing a potential unacceptable human health/ecological risk been successfully treated/removed from the site?
    - If all chlorinated ethene impacted soils representing an unacceptable risk to future receptors underlying 134-138 and 140 Henry Street have been removed/treated, the removal confirmed by comparison of soil leachate (against screening criteria from ANZAST 2018 95 % and NHMRC 2017 recreational exposure values) and soil-vapour analytical results against the interim soil vapour health investigation levels for volatile organic chlorinated compounds (NEPC 2013) and soils have been disposed of in accordance with EPA waste guidelines or been assessed as suitable for retention following remediation then the decision will be Yes. Otherwise the decision will be No and additional assessment and/or remediation will be required to demonstrate the objectives of the RAP have been achieved;

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Where assessment of AEC 2 (former service station), AEC 3 (transformers) and AEC 4 (fill material) have identified residual, localised contamination:
  - Has all petroleum infrastructure and associated contaminated soils representing a potential unacceptable human health/ecological risk under the proposed development scenario been successfully treated/removed from the site?
    - If all petroleum hydrocarbon contaminated soils have been removed/treated, the removal/treatment confirmed by assessment of residual soil COPC concentrations and the NEPC (2013) criteria, and soils/infrastructure have been disposed of in accordance with EPA waste guidelines or been assessed as suitable for retention following remediation then the decision will be Yes. Otherwise the decision will be No and additional assessment and/or remediation will be required to demonstrate the objectives of the RAP have been achieved;
  - Has all contaminated fill material which represents a potential unacceptable human health/ecological risk with respect to the proposed development scenario been successfully treated/removed from the site?
    - If all contaminated soils have been removed/treated, the removal/treatment confirmed by assessment of residual/treated soil COPC concentrations and the NEPC (2013) criteria, and soils have been disposed of in accordance with EPA waste guidelines or been assessed as suitable for retention following remediation then the decision will be Yes. Otherwise the decision will be No and additional assessment and/or remediation will be required to demonstrate the objectives of the RAP have been achieved;
- Where impacted material which is demonstrated as being environmentally suitable for retention on site under a cap/cover physical separation, have marker layer and physical separation arrangements been installed appropriately and in accordance with RAP requirements?
  - The marker and physical separation arrangements must be installed across the extent of the impacted soils. The marker layer must be installed to the RAP requirements, as well as the manufacturer's installation requirements (**Section 8.2.6**). The vertical and lateral extents of the marker layer must be surveyed, along with consistent and comprehensive photographic evidence.
  - Where soil-based material is to be used for physical separation, placed above the marker layer and readily accessible to human users, this material is required to be validated as meeting the site validation requirements as discussed in **Section 8.7**.
  - All imported materials to be used as the physical separation arrangement must be environmentally suitable, as defined below. Growing media should have levels of constituents consistent with ecological protection criteria for 'urban residential and public open space' as provided to NEPC (2013).
  - If the marker layer and physical separation arrangements have been installed with the requirements of the RAP, then the answer will be Yes. Otherwise the decision will be No and additional assessment and/or remediation is required to demonstrate the objectives of the RAP have been achieved.
- Are accessible soils ecologically suitable?
  - If concentrations of COPCs in soils proposed to be used for establishment of site vegetation are below EIL/ESL criteria, the answer to the decision is yes.
- Are imported soils (where required) ecologically suitable for their proposed use?

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- If imported soils are comprised of VENM or ENM and they are used in accordance with the relevant exemptions, and analyte levels within the soils meet all the adopted ecological and human health criteria (**Section 8.5**) for accessible soils on the site then the decision will be Yes. Otherwise the decision will be No.

- Subsequent to the removal/treatment of chlorinated ethene impacted soils are groundwater chlorinated ethene concentrations stable/decreasing?
  - If an assessment of the attenuation of groundwater VOC concentrations demonstrated by either direct measurement of decreasing concentrations, or stable concentrations and secondary indicators of attenuation, then the answer to the decision was Yes. If No, further remediation/ongoing monitoring may be required to address outstanding contamination issues.
- Subsequent to the removal/treatment of chlorinated ethene impacted soils, and establishment that groundwater chlorinated ethene concentrations are stable/decreasing, do residual offsite concentrations of groundwater represent an unacceptable risk to sensitive downgradient receptors?
  - If assessment of the groundwater (by either site specific risk assessment and/or delineation of the plume extent) indicate that no potentially unacceptable risks are posed to sensitive downgradient receptors, the answer to the decision is No. Otherwise further remediation/ongoing monitoring may be required to address outstanding risks.
- Is an EMP required to address management of any residual potential contamination?
  - Was the answer to any of the above decisions No, or were any contaminated fill materials retained on site below a marker layer? If Yes, the issues are required to be documented within an EMP to be prepared for the site to address outstanding contamination issues. If No, an EMP is not required to be prepared for the site to address outstanding issues.
- Is the site suitable for the proposed use?
  - Was the answer to any of the above decisions No? If No, were the outstanding issues appropriately addressed by implementation of an EMP to the satisfaction of the auditor?
  - If the answer to the first question was Yes, or if the issues were appropriately addressed by an EMP, the answer to the above decision will be Yes. Otherwise, the answer to the decision will be No and additional remediation/management will be required.

8.2.5 Specify Limits of Decision Error

This step is to establish the decision maker's tolerable limits on decision errors, which are used to establish performance goals for limiting uncertainty in the data. Data generated during this project must be appropriate to allow decisions to be made with confidence.

Specific limits for this project have been adopted in accordance with the appropriate guidance from the NSW EPA, NEPC (2013), ANZECC (2000), DEC (2007[20]), appropriate indicators of data quality (DQIs used to assess QA/QC) and standard JBS&G procedures for field sampling and handling.

To assess the usability of the data prior to making decisions, the data will be assessed against pre-determined DQIs for completeness, comparability, representativeness, precision and accuracy.

The pre-determined Data Quality Indicators (DQIs) established for the project are discussed below in relation to precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS parameters), and are shown in **Table 9.1**.

[20] *Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination*. NSW Department of Environment and Conservation 2007 (DEC 2007)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- **Precision** - measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples.
- **Accuracy** - measures the bias in a measurement system. The accuracy of the laboratory data that are generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- **Representativeness** –expresses the degree which sample data accurately and precisely represent a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
- **Comparability** - expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; ensuring analysing laboratories use consistent analysis techniques and reporting methods.
- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.
- **Sensitivity** – expresses the appropriateness of the chosen laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted criteria.

If any of the DQIs are not met, further assessment of the data set will be required in order to determine whether the non-conformance has significant effects on the usefulness of the data. Corrective action to correct an adverse impact on the reliability of the dataset may include, but is not limited to, the request of further information from samplers and/or analytical laboratories, downgrading of the quality of the data or alternatively, re-collection of the data.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 8.1: Summary of Quality Assurance / Quality Control Program

Data Quality Objectives	Frequency	Data Quality Indicator
Precision		
Blind duplicates (intra laboratory)	1 / 20 samples	<50 % RPD[1], asbestos in agreement
Blind duplicates (inter laboratory)	1 / 20 samples	<50 % RPD[1], asbestos in agreement
Laboratory duplicates	1 / 20 samples	<50 % RPD[1], asbestos in agreement
Accuracy		
Surrogate spikes	All organic samples	70-130 %
Laboratory control samples	1 per lab batch	70-130 %
Matrix spikes	1 per lab batch	70-130 %
Representativeness		
Sampling appropriate for media and analytes		-[2]
Samples extracted and analysed within holding times.	-	Soil: organics (14 days), inorganics (6 months) Groundwater: metals (6 months, other than mercury - 28 days), sVOCs (>C_{10} - 7 days), volatiles (<C_{10} - 14 days) Soil vapour: sorbent tubes VOCs/TRH (28 days)
Trip spike (soil and groundwater only)	1 per sampling event	70-130 % recovery
Storage blank (soil and groundwater only)	1 per sampling event	<LOR
Rinsate blank (soil and groundwater only)	1 per sampling data where reusable equipment is used	<LOR
Method blank (soil vapour only)	1 per lab batch	<LOR
Trip blank (soil vapour only)		
Laboratory blanks	1 per lab batch	<LOR
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All samples[2]
Standard analytical methods used for all analyses	All Samples	All samples[2]
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples[2]
Limits of reporting appropriate and consistent	All Samples	All samples[2]
Completeness		
Sample description and COCs completed and appropriate	All Samples	All samples[2]
Appropriate documentation	All Samples	All samples[2]
Satisfactory frequency and result for QC samples	All QA/QC samples	-[2]
Data from critical samples is considered valid	-	Critical samples valid[2]
Sensitivity		
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	All Samples	All samples

[1] If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgment will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

[2] A qualitative assessment of compliance with standard procedures and appropriate sample collection methods will be completed during the DQI compliance assessment.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.2.6 Optimise the Design for Obtaining Data

The validation sampling design is summarised for each specific type of validation works as follows.

8.2.6.1 Validation of Chlorinated Ethenes in Soil and Soil-vapour

Soil Excavation Validation (Vapour)

The required remedial excavation extent will be informed by the VSAQP. Validation of the removal of soils with unacceptable levels of chlorinated ethene soil/soil-vapour concentrations will be conducted in accordance with the procedure presented following. Validation of chlorinated ethene impacted soil removal will require demonstration that residual soils do not result in unacceptable contaminated soil-vapour or leachate generation. Action criteria for soils will be derived within the VSAQP and presented in the relevant RWP(s) and shall be based on site development specific considerations: soil characteristics, backfill characteristics, depth of samples below finished levels, anticipated contaminant transformation/attenuation, rainwater infiltration, etc.

Inspection and sampling of excavations following removal of shallow fill will be required to confirm the absence of residual infrastructure or impacted soils which may result in unacceptable soil vapour concentrations. Where residual impact which may result in unacceptable soil-vapour generation remains (identified via visual/olfactory indicators, field screening or laboratory analysis)), these materials will be further chased out prior to backfill.

Field screening for unacceptable soil-vapour generation potential will be completed in accordance with the following methodology:

- Inspection of residual soils exposed on the excavation surfaces to identify visual or olfactory indicators of residual impact;
- Installation of temporary soil vapour probes or shallow soil vapour wells (per procedure presented in **Section 8.5**);
  - 1 temporary soil vapour probe per 5 m of excavation wall, with a minimum of one per wall; and
  - 1 temporary soil vapour probe per 25 m^2 of excavation base, with a minimum of four per excavation.
- Soil sample locations from the walls of excavations formed by the removal of impacted soils at a frequency of one sampler per 5 m of excavation wall, with a minimum of one per wall and 1 per 25 m^2 from the base of the excavation, with a minimum of four samples.

Installed probes shall be left to equilibrate (30 minutes for spear point or similar probes and 24 hours for soil vapour wells, in accordance with NEPC (2013) requirements) and then soil-vapour samples extracted. Soil vapour samples will be extracted from the temporary probes and analysed (either in field by portable gas-chromatography or by laboratory analysis). Determination of excavation extent acceptability will be made based on comparison of residual soil vapour sample concentrations with action criteria derived in the VSAQP and presented in the relevant RWP(s)**.**

Soil and soil-vapour validation will be analysed for concentrations of TRHs and VOCs. Soil samples will be subjected to ASLP and the resulting leachate fluid analysed for concentrations of CEs to assess the potential for leachate generation. Soil-vapour samples will be compared against site validation criteria (i.e. NEPM 2013 HIL-B and HIL-C, **Section 8.7**) and soil leachate generation compared against groundwater screening criteria (i.e. ANZAST (2018) and NHMRC (2017)). Should exceedance of the screening criteria be identified, further assessment and/or remediation will be required.

Validation of Final Site Surface

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Upon backfilling the remedial excavation and establishment of approximate final site levels, the final site-surface vapour concentrations will require validation. It is anticipated that final site levels will comprise exposed soils/garden beds. On that basis, validation will require to be undertaken by installation of either permanent or temporary soil-vapour wells on an approximate 10 m grid across the remedial excavation footprint. The vapour probes shall be installed to target soils no deeper than 1 m below the final site levels.

A minimum of two rounds of soil-vapour sampling will be conducted per the requirements of the VSAQP. Samples of soil-vapour will be withdrawn from each soil vapour well and submitted for laboratory analysis. Determination of remedial success will be based on comparison of laboratory analytical results with validation criteria presented in the VSAQP and relevant RWP(s).

8.2.6.2 Validation of Petroleum Infrastructure Removal (if required)

Inspection of excavations following removal of petroleum infrastructure will require to be completed to confirm the absence of residual impact which may exceed the NEPC (2013) criteria. Where residual impact which may exceed the NEPC (2013) criteria remain (via visual inspection, olfactory detection and/or through the use of a PID assessment), these materials will be further chased out prior to validation sampling.

Subsequent to the removal of the petroleum infrastructure and associated backfill, validation requirements, consistent with NSW EPA (2014[21]) requirements shall include:

- Sample locations from the walls of excavations formed by the removal of USTs/backfill sands at the frequency of one sample per 5 m of excavation wall per identifiable stratum or 1 m in wall depth, with a minimum of one per wall;
- Sample locations from the base of excavations formed by the removal of USTs at the frequency of one sample per 25 m^2, with a minimum of two per former UST location;
- Discrete sample locations under other petroleum infrastructure (i.e. remote fill points, fuel dispensers). In the event that significant impacted soil volumes are removed from these areas, the adopted sampling frequency for excavation bases and walls following UST removal will be adopted; and
- Sample locations at a linear spacing of 5 m underlying pipelines.

Soil samples shall be analysed for TRHs, PAHs, heavy metals and VOCs and compared against NEPM (2013) site validation criteria **Section 8.7**.

8.2.6.3 Validation of Impacted Fill Management (if required)

Where residual fill impacts are identified (AEC 3 and AEC 4), they are required to be either removed or demonstrated as being suitable to remain on the site under the proposed development scenario (above or below a marker layer). Removal of soils is required to be undertaken to the top of unimpacted fill material, natural soils or a depth of 0.5 m where fill is to be capped *in-situ*.

Subsequent to the removal of impacted fill, validation requirements shall include:

- Sample locations from the walls of excavations formed by the removal of soils at the frequency of one sample per 5 m of excavation wall per identifiable stratum, with a minimum of one per wall; and
- Sample locations from the base of excavations formed by the removal of soils at the frequency of one sample per 25 m^2, with a minimum of one per excavation.

[21] *Technical Note: Investigation of Service Station Sites*. NSW EPA April 2014 (EPA 2014)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.2.6.4 Installation of the Physical Barrier

Where residual contaminated fill, which exceeds criteria for land use but is determined to be suitable for retention under a cap, is required to be retained on site, installation of physical separation arrangements (within road reserves and landscape areas where fill removal is not possible/practicable) shall be defined by survey as completed by a registered surveyor and/or building as-built drawings sufficient to identify:

- The lateral extent and upper depth height of known environmentally impacted materials (i.e. residual fill materials underlying the cover) within each remediation area/stage;
- The lateral extent and type of cover (e.g. permanent pavement, soil thickness) within the remediation area/stage; and
- Confirmation, by photos or otherwise, of the installation of the 'marker layer' underlying the cover (as required).

Physical separation arrangement requirements (i.e. thickness etc.) are detailed in **Section 7.6.6**.

Validation of installation shall demonstrated by inclusion of the following information in the validation report(s):

- Photographic evidence of marker layer application;
- Survey plans including spot measurements of the upper depth of retained contaminated material, the final height of the cap and the lateral extent of the caped area(s); and
- Material characterisation and importation records to demonstrate that capping materials are environmentally suitable for the relevant purposes.

It is anticipated the following materials will be used within the road reserves and across the broader site:

Growing Media

Soils to be imported and used as growing media within the site shall be sampled at a rate of at least one sample per 100 m^3 with a minimum of three samples per source/end location. Samples shall be analysed for TRH, PAHs, heavy metals, (including As, Cd, Cr, Cu, Pb, Hg, Ni and Zn), OCPs, PCBs, asbestos, soil pH and CEC. The materials shall be further inspected for any aesthetic indicators of contamination.

Site sourced natural soils shall be analysed for heavy metals, TRH, VOCs, OCPs, PCBs, pH and CEC. In addition, assessment of the potential presence of aesthetic issues, including staining, discolouration and/or odorous soil conditions will be completed.

Visual inspection is required by the Environmental Consultant during placement to confirm the material is consistent with the material sampled at the source site. Copies of classification certificates and importation records are required to be kept for inclusion in the validation report(s)

VENM

VENM shall be as defined under the *Protection of the Environment Operations (POEO) Act 1997* and characterised by at least five samples per source site and one per 1 000 m^3 being collected if more than 10 000 m^3. Visual inspection is required by the Environmental Consultant at the source site to confirm the material is consistent with the definition of VENM. Copies of VENM certificates and importation records are required to be kept for inclusion in the validation report(s)

ENM

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Sampling and analysis is required to be undertaken as per the exemption (EPA 2014c[22]).

Visual inspection is required by the Environmental Consultant during placement to confirm the material is consistent with the material sampled at the source site. Copies of ENM certificates and importation records are required to be kept for inclusion in the validation report(s)All ENM samples are required to be assessed for the presence of asbestos in addition to the requirements of the ENM analytical suite (EPA 2014c)

Recycled Products

Sampling of materials as per an EPA exemption is required to be undertaken by the facility in accordance with the exemption. In addition, where materials are proposed for beneficial reuse under a NSW EPA exemption (i.e. imported to the site), fill material will need to be further assessed by The Environmental Consultant for land use suitability. Sampling densities and analysis for COPC will be dependent on the volume, material type, source and subject to Site Auditor endorsement. All samples are required to be submitted for analysis of asbestos in addition to other relevant COPCs.

8.2.6.5 Materials Classification for Offsite Disposal

Materials sampled for waste classification in accordance with EPA (2014a) shall be sampled at an appropriate rate to characterise the materials. Stockpiles will be sampled in accordance with NEPC (2013). If the stockpile is greater than 200 m^3 the sampling rate shall be determined by the Field Scientist on the basis of the volume of materials and any potential heterogeneity occurring within the materials.

Sampling of materials as per the ENM exemption (or similar) requires to be undertaken in accordance with the exemption.

Sampling of site materials as per a VENM classification will require the collection of at least 10 samples with one per 1 000 m^3 being collected if more than 10 000 m^3 has been removed.

Sampling of materials as per an EPA exemption is required to be undertaken by the receiving facility in accordance with the exemption. In addition, where materials are proposed for beneficial reuse under a NSW EPA exemption (i.e. imported to the site), fill material will need to be further assessed by The Environmental Consultant for land use suitability. Sampling densities and analysis for COPC will be dependent on the volume, material type, source and subject to Site Auditor endorsement.

8.2.6.6 Confirmation of Hydrocarbon Removal from Soils

All petroleum hydrocarbon impacted soils to be treated on site (refer to **Section 7.6.5**), will be sampled at a density of one sample per 70 m^3 (minimum three samples per stockpile) and submitted for relevant COPCs (**Table 8.2**).

The successful treatment of CE impacted materials will be informed by field screening of soil vapour levels within treated stockpiles. A temporary soil vapour probe will be driven 1 m into discrete stockpiles of material with a maximum volume of 50 m^3. A soil vapour sample will be withdrawn from the stockpile after an equilibration period of 30 minutes, and assessed either in the field by portable gas-chromatography or by laboratory analysis. Specific action criteria for CE impacted stockpile remediation will be derived in the VSAQP and presented in the relevant RWP(s).

Where soil-vapour criteria have been satisfied, the stockpiles will be sampled and analysed for the presence of soil-bound CEs. A minimum of three soil samples are required to be collected from at least 200 mm below the stockpile surface. If detections of soil-bound CEs are identified, subsequent leachate analysis will be conducted to determine whether the CEs present a potential groundwater

[22] *The Excavated Natural Material Order 2014*. NSW EPA dated 24 November 2014, NSW EPA 2014b

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

migration risk. Determination of suitability to be retained on site will be made by comparison of leachate data against criteria presented in **Section 8.7** (i.e. ANZAST (2018) and NHMRC (2017)).

8.2.6.7 Validation of Groundwater Impact Attenuation

At the commencement of soil remediation at 134-138 and 140 Henry Street, concentrations of VOCs in groundwater shall be monitored via groundwater monitoring events conducted on offsite wells existing (JBMW01, JMBW02, JBMW03, JBMW05, JBMW06 and JBMW07) biannually. Monitoring of offsite groundwater VOC concentrations will continue for a minimum of four sampling events or until stable/decreasing concentrations are determined by a statistical assessment using the Mann-Kendall test).

Groundwater validation samples will be assessed to the ANZAST (2018) and NHMRC (2017) validation criteria.

8.2.6.8 Validation of Groundwater Offsite Migration Risk

Sufficient assessment will be required to demonstrate that offsite groundwater impacts do not present an unacceptable risk to downgradient receptors. This may comprise risk based determination that identified concentrations do not represent an unacceptable risk at the receiving water body and/or nearby building basements or complete delineation of the CE plume.

As a minimum, confirmation of the groundwater flow direction and review of groundwater concentrations following validation of groundwater impact attenuation (**Section 8.2.6.7**). Further installation and sampling of groundwater monitoring wells may be required as part of this works, the details of which shall be confirmed following detailed development designs and included in future RWP(s).

8.2.6.9 Sampling Frequency

Table 8.2 summarises the required validation sampling frequencies

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 8.2 Validation Sample Analytical Frequencies

Purpose	Media	Frequency	Analytes
Validate Removal of Impact Source			
Chlorinated Ethene Impacted Soil Excavation Validation	Soil Vapour	**Field Screening (GC-PID) or Laboratory Analysis** 1 / 5 m of excavation wall minimum of 1 / wall; and 1 / 25 m^2 of base minimum of 1 / excavation.	**Screening** PCE/TCE concentrations by GC-PID **Laboratory Analysis** VOCs (USEPA 8260)
	Soil / Soil Leachate	**Laboratory Analysis** 1 / 5 m of excavation wall minimum of 1 / wall; and 1 / 25 m^2 of base minimum of 1 / excavation.	**Laboratory Analysis** VOCs (LTM-ORG-2103) ASLP (LTM-GEN-7010)
Validation of Final Site Surfaces for CEs in Soil Vapour	Soil Vapour	**2 Rounds - Laboratory Analysis** 1 / 5 m of excavation wall minimum of 1 / wall; and 1 / 25 m^2 of base minimum of 1 / excavation.	**Laboratory Analysis** VOCs (USEPA 8260)
Petroleum Infrastructure and Impacted Soil Remedial Excavations Validation	Soil	**Laboratory Analysis** 1 / 5 m wall / stratum / metre depth 1 / 25 m^2 base 1 / 5 m underlying service lines.	TRHs (LTM-ORG-2010) Heavy metals (LTM-MET-3040) PAHs (LTM-ORG-2130) VOCs (LTM-ORG-2150)
Impacted Fill Excavation Validation	Soil	**Laboratory Analysis** 1 / 5 m wall / stratum / metre depth 1 / 25 m^2 base	Relevant COPCs and appropriate NATA accredited laboratory methodology

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Purpose	Media	Frequency	Analytes
Importation / Exportation of Soils			
Classification for Offsite Disposal	Soil	**Laboratory Analysis** 1 / 25 m^3 minimum 3 samples per material type	Heavy metals (LTM-MET-3040) TRHs and BTEX (LTM-ORG-2010) PAHs (LTM-ORG-2130) OCPs and PCBs (LTM-ORG-2220) Asbestos (AS4964-2004) VOCs (LTM-ORG-2150)
Classification for Importation to Site	Soil	**Laboratory Analysis** **VENM** 5 samples and an addition 1/1000 m^3 for volumes exceeding 10 000 m^3 **Growing Media** 1 / 100 m^3 and minimum 3 samples **ENM and Recycled Products** In accordance with relevant EPA guidance	**VENM** Heavy metals (LTM-MET-3040) TRHs and BTEX (LTM-ORG-2010) PAHs (LTM-ORG-2130) OCPs and PCBs (LTM-ORG-2220) Asbestos (AS4964-2004) **Growing Media** Heavy metals (LTM-MET-3040) TRHs (LTM-ORG-2010) PAHs (LTM-ORG-2130) OCPs and PCBs (LTM-ORG-2220) VOCs (LTM-ORG-2150) Asbestos (AS4964-2004) pH (LTM-GEN-7090) CEC (LTM-GEN-7080) **ENM and Recycled Products** In accordance with relevant EPA guidance with asbestos analysis (AS4964-2004)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Purpose	Media	Frequency	Analytes
Validation of Stockpiled Soil Treatment			
Validation of Chlorinated Ethene Removal from Soils	Soil-Vapour	**Field Screening (GC-PID) or Laboratory Analysis** 1 / stockpile (max volume 50 m^3)	**Screening** PCE/TCE concentrations by GC-PID **Laboratory Analysis** VOCs (USEPA 8260)
	Soil / Soil Leachate	3 / stockpile (maximum volume 50 m^3)	**Laboratory Analysis** VOCs (LTM-ORG-2103) ASLP (LTM-GEN-7010)
Validation of Petroleum Hydrocarbon Removal from Soils	Soil	1 / 70 m^3 and minimum 3 samples per stockpile	TRHs (LTM-ORG-2010) Heavy metals (LTM-MET-3040) PAHs (LTM-ORG-2130) VOCs (LTM-ORG-2150)
Validation of Groundwater and Soil Vapour Impact Attenuation	Groundwater and Soil Vapour	Minimum 4 monitoring rounds on 6 wells	VOCs (LTM-ORG-2150) Dissolved gases (LTM-ORG-2070) Chloride (LTM-INO-4090) Ferrous Iron (LTM-INO-4190) Nitrate (APHA 4500 NO3) pH (LTM-GEN-7090) Sulphate (LTM-INO-4110) Organic Carbon (APHA 5310B) Alkalinity (APHA 2320)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.3 Soil Sampling Methodology

The soil sampling method shall be determined by the Field Scientist as consistent with the observations of the site sub-surface and appropriate to generate representative samples. The soil sampling method shall be consistent with the data quality indicators in **Section 8.2.5**.

Where sample locations are placed by boreholes, undisturbed samples, as collected by push tube or SPT sampler, are preferred where able to be effectively implemented. Otherwise samples may be recovered from solid flight augers or via use of an excavator/hand tools. Re-usable equipment shall require to be decontaminated between sampling locations.

8.3.1 Soil Sample Containers

During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indications of contamination shall be noted on field reporting sheets/field logs.

Collected soil samples shall be immediately transferred to sample containers of appropriate composition (glass jars) fitted with Teflon sealed lids. 500 mL samples shall be additionally collected and placed in new zip lock bags where asbestos analysis is required. Sample labels shall record sample identification number and date and time of sampling. Sample containers shall be transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form shall be completed and forwarded with the samples to the testing laboratory, containing the following information:

- Sample identification;
- Signature of sampler;
- Date of collection;
- Type of sample;
- Number and type of container;
- Inclusive dates of possession; and
- Signature of receiver.

8.3.2 PID Screening

Soil samples will be screened during field works using a PID to assess the potential presence of VOCs including petroleum hydrocarbons. Samples obtained for PID screening will be placed in a sealed plastic bag for approximately 5 minutes to equilibrate, prior to a PID being attached to the bag. Readings will then be monitored for a period of approximately 30 seconds or until values stabilise and the stable/highest reading will be recorded on the field sample forms. The PID will be calibrated prior to the commencement of field works and then check readings will be completed on a daily basis during the field program using suitable calibration gas. If required, the PID will be re-calibrated during the field program in accordance with manufacturer's instructions.

A GC-PID will be used to analyse gas samples on the site for concentrations of specific CEs. The GC-PID will be calibrated against gas standards and will offer real time screening of soil-vapour impacts to assist in advancement of the remedial excavation. The specific action criteria for PID screening shall be detailed in a Vapour Validation Sampling, Analysis and Quality Plan (VSAQP) issued prior to or as part of the stage specific RWPs or separately to the site auditor.

8.4 Groundwater Sampling Methodology

Groundwater wells will be inspected prior to sampling to ascertain their condition and determine whether they're suitable for sampling. If the presence of excessive sediment is identified the wells should be purged and allowed to settle for a minimum of 5 days prior to sampling.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Each monitoring well will be gauged with an Interface Probe (IP) which can detect NAPLs. The groundwater at each well will then be purged with a QED low flow/micropurge submersible bladder pump, using fresh disposable bladders and low-density polyethylene tubing, to remove the standing water. During removal, physiochemical parameters (pH, electrical conductivity, dissolved oxygen, reduction-oxidation potential and temperature) will be monitored until stabilisation, consistent with the requirements of VIC EPA (2000[23]). Groundwater samples will be taken from the end of the disposable LDPE tubing after parameter stabilisation has occurred.

Collected groundwater samples will be immediately filtered (as necessary) and transferred to laboratory supplied sample bottles. The sample containers will be transferred to a chilled iced box for sample preservation prior to and during shipment to the testing laboratory. A chain of custody form will be completed and forwarded with the samples. Samples will be analysed in accordance with the laboratory schedule (**Table 7.3**).

8.5 Soil-vapour Assessment

8.5.1 Temporary Soil Vapour Probe and Soil Vapour Well Installation

Temporary probes and soil-vapour wells are required to be installed to a minimum depth, or penetration if installed into excavation walls, of 1.0 m.

Temporary Soil Vapour Probes

temporary soil vapour probe will be directly driven into the face of exposed soils at the excavation base or walls to the required penetration depth, either by hand or mechanically assisted, and allowed to sit for a minimum of 30 minutes prior to sampling. The probes may be withdrawn and reused subject to appropriate decontamination.

Stockpiles requiring soil-vapour assay will be assessed via spear probes.

Soil Vapour Wells

Where soil-vapour wells are to be used, boreholes will be advanced via hand auger or drill rig. 6 mm nylon tubing with a stainless steel tip will be installed to the depth of the borehole, which will then be backfilled with graded sand adjoining the base of the sample tube, overlain by a nominal thickness of powdered bentonite, and backfilled with grout/bentonite chips to create an air-tight seal at the surface. Soil-vapour wills will be left to equilibrate for a period of 24 hours prior to sampling.

8.5.2 Soil-vapour Sampling

PID screening will be utilised to screen for residual volatile impacts within remedial excavations and treated soils. Samples will be obtained via installation of temporary 'spear probes' or soil-vapour wells. Once the probes/wells have equilibrated for the required period (30 minutes for spear probes and 24 hours for vapour wells), the PID will be attached to sample tubing for a period of approximately 30 seconds or until values stabilise and the stable/highest reading will be recorded on the field sample forms.

Soil-vapour will be sampled in accordance with the following methodology:

- A multi-gas meter will then be used to purge each probe for a period of at least 5 mins. Gas readings will be monitored until oxygen and PID readings stabilise;
- Following this a leak detection evaluation will be completed via placement of an isopropyl alcohol-soaked rag over the top of the backfilled borehole to assess the potential occurrence of leaks whilst the gas detector is purging the sample point. Elevated PID readings on the

[23] *Groundwater Sampling Guidelines*. Victoria Environment Protection Authority, April 2000, VIC EPA (2000);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

gas detector will indicate a leaking probe. Any leaking probes will be required to be reinstalled and re-checked prior to sampling using the same method;

- Attach via use of silicon a carbon tube to the exposed temporary soil vapour probe tubing;
- Attach a calibrated low-flow pump (<0.2 L/min) to the carbon tube using additional section of 6mm Teflon tubing as required;
- Withdraw sufficient soil gas over the carbon tube to ensure required detection limits are met for relevant COPCs and submit tubes for analysis as per **Section 8.7**.

8.6 Laboratory Analysis

NATA accredited laboratories shall be used for all analysis of samples. Appropriate methods and LORs are required for comparison to relevant criteria. Laboratory methods and LORs are presented in **Table 8.2** below.

Table 8.3: Soil Laboratory Analysis Methods (all units in mg/kg)

Analyte	Limit of Reporting	Laboratory Method
Metals		
Arsenic	2.0	LTM-MET-3040_R0
Cadmium	0.4	LTM-MET-3040_R0
Chromium (total)	5.0	LTM-MET-3040_R0
Copper	5.0	LTM-MET-3040_R0
Lead	5.0	LTM-MET-3040_R0
Nickel	5.0	LTM-MET-3040_R0
Zinc	5.0	LTM-MET-3040_R0
Mercury (inorganic)	0.1	LTM-MET-3040_R0
TRH		
$C_6 – C_9$ Fraction	20	TRH C6-C36 - LTM-ORG-2010
$C_{10} – C_{14}$ Fraction	20	TRH C6-C36 - LTM-ORG-2010
$C_{15} – C_{28}$ Fraction	50	TRH C6-C36 - LTM-ORG-2010
$C_{29} – C_{36}$ Fraction	50	TRH C6-C36 - LTM-ORG-2010
BTEX		
Benzene	1.0	TRH C6-C40 - LTM-ORG-2010
Toluene	1.0	TRH C6-C40 - LTM-ORG-2010
Ethylbenzene	1.0	TRH C6-C40 - LTM-ORG-2010
Total Xylenes	3.0	TRH C6-C40 - LTM-ORG-2010
PAHs		
Benzo(a)pyrene	0.5	LTM-ORG-2130
Total PAHs	0.5	LTM-ORG-2130
PCBs		
PCBs (total)	0.1	LTM-ORG-2220
OCPs		
Aldrin + Dieldrin	0.05	LTM-ORG-2220
Chlordane	0.1	LTM-ORG-2220
DDT + DDD + DDE	0.05	LTM-ORG-2220
Endosulfan	0.05	LTM-ORG-2220
Endrin	0.05	LTM-ORG-2220
Heptachlor	0.05	LTM-ORG-2220
Hexachlorobenzene	0.05	LTM-ORG-2220
Methoxychlor	0.05	LTM-ORG-2220
Mirex	0.05	LTM-ORG-2220
Toxaphene	0.05	LTM-ORG-2220
VOCs		
PCE	0.5	LTM-ORG-2150 VOCs
TCE	0.5	LTM-ORG-2150 VOCs
Cis 1,2 DCE	0.5	LTM-ORG-2150 VOCs
Trans 1,2 DCE	0.5	LTM-ORG-2150 VOCs
VC	0.5	LTM-ORG-2150 VOCs
Other		

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Analyte	Limit of Reporting	Laboratory Method
Asbestos	Presence / 0.001 % w/w	PLM / Dispersion Staining as per AS4964:2004
Soil pH	0.1	5:1 leach

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 8.4: Groundwater Laboratory Analysis Methods (all units in mg/L)

Analyte	Limit of Reporting	Laboratory Method
Metals		
Arsenic	0.001	LTM-MET-3040
Cadmium	0.0002	LTM-MET-3040
Chromium (total)	0.001	LTM-MET-3040
Copper	0.001	LTM-MET-3040
Lead	0.001	LTM-MET-3040
Nickel	0.001	LTM-MET-3040
Zinc	0.005	LTM-MET-3040
Mercury (inorganic)	0.0001	LTM-MET-3040
TRH		
$C_6 – C_9$ Fraction	0.02	TRH C6-C36 - LTM-ORG-2010
$C_{10} – C_{14}$ Fraction	0.05	TRH C6-C36 - LTM-ORG-2010
$C_{15} – C_{28}$ Fraction	0.1	TRH C6-C36 - LTM-ORG-2010
$C_{29} – C_{36}$ Fraction	0.1	TRH C6-C36 - LTM-ORG-2010
BTEX		
Benzene	0.001	TRH C6-C40 - LTM-ORG-2010
Toluene	0.001	TRH C6-C40 - LTM-ORG-2010
Ethylbenzene	0.001	TRH C6-C40 - LTM-ORG-2010
Total Xylenes	0.003	TRH C6-C40 - LTM-ORG-2010
PAHs		
Benzo(a)pyrene	0.00001	LTM-ORG-2130
Total PAHs	0.00001	LTM-ORG-2130
VOCs		
PCE	0.001	LTM-ORG-2150 VOCs
TCE	0.001	LTM-ORG-2150 VOCs
Cis 1,2 DCE	0.001	LTM-ORG-2150 VOCs
Trans 1,2 DCE	0.001	LTM-ORG-2150 VOCs
VC	0.001	LTM-ORG-2150 VOCs

Table 8.5: Soil-vapour Laboratory Analysis Methods (all units stated in mg assuming sample volume of >25 L)

Analyte	Limit of Reporting	Laboratory Method
TRH		
$C_6 – C_9$ Fraction	0.01	TRH C6-C36 - LTM-ORG-2010
BTEX		
Benzene	0.0005	LTM-ORG-2150 VOCs
Toluene	0.0005	LTM-ORG-2150 VOCs
Ethylbenzene	0.0005	LTM-ORG-2150 VOCs
Total Xylenes	0.0005	LTM-ORG-2150 VOCs
VOCs		
PCE	0.0005	LTM-ORG-2150 VOCs
TCE	0.0005	LTM-ORG-2150 VOCs
Cis 1,2 DCE	0.0005	LTM-ORG-2150 VOCs
Trans 1,2 DCE	0.0005	LTM-ORG-2150 VOCs
VC	0.0005	LTM-ORG-2150 VOCs

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.7 Validation Criteria

Determination that remediation of the site has been achieved will be completed in accordance with the validation criteria set below. Based on the proposed development details, in accordance with the decision process for assessment of urban redevelopment sites (EPA 2017) concentrations of contaminants in media shall be compared against relevant criteria presented in **Tables 8.6, 8.7** and **8.8** sourced from the regulatory guidance listed below.:

In addition to site media contaminant concentrations, the Environmental Consultant will require to consider the circumstances which would trigger an assessment of aesthetics in accordance with NEPC (2013) throughout remediation. Where the triggers are satisfied, aesthetic issues which trigger the requirement for assessment shall be considered by the Environmental Consultant and any further remediation/management requirements identified to the Remediation Contractor

Soil Validation Criteria

- Health based Investigation Levels (HILs) for residential with limited access to soils (HIL-B), recreational and public open space (HIL-C) and commercial/industrial land use (HIL-D) – NEPC (2013);
- Health Screening Levels (HSLs), both fine and coarse-grained soils, for petroleum hydrocarbons considering potential for vapour intrusion – NEPC (2013);
- As a conservative measure, generic and site specific ecological investigation levels (EILs) were derived through the added contaminant limits;
- Management Limits for TRH, both fine and coarse-grained soils, for residential/public open space and commercial/industrial land use – NEPC (2013); and
- Ecological Screening Levels (ESLs) for TRH fractions, BTEX and benzo(a)pyrene, both fine and coarse-grained soil, for residential/public open space and commercial/industrial land uses – (NEPC 2013);

Groundwater/Leachate Criteria

- Recreational Health and aesthetics-based criteria adopted from the *Australian Drinking Water Guidelines* – NHMRC (2017);
- Groundwater HSLs, both fine and coarse-grained soils for petroleum hydrocarbons considering potential for vapour intrusion – NEPC (2013); and
- 95 % protection of freshwater aquatic ecosystems from the *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* – ANZAST (2018);

Soil-vapour Criteria

- Interim Soil-vapour Health Investigation Levels for Volatile Organic Chlorinated Compounds – NEPC (2013); and
- Soil Vapour HSLs for Vapour Intrusion – NEPC (2013).

Where there are no NSW EPA endorsed thresholds the laboratory LOR has been adopted as an initial screening value for the purposes of this assessment.

The specific requirements for this assessment shall be detailed in a the VVSAQP, either included within the stage specific RWPs or to be issued separately, to the Site Auditor subsequent to delineation of soil-vapour impact. The RWPs/VVSAQP will include PID action criteria to guide field screening assessment

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 8.6 Health Based Soil Investigation Criteria and Hydrocarbon Management Limits (all units in mg/kg)

	Health Investigation Levels			Health Screening Levels[6]			Management Limits[5]	
	HIL-B	HIL-C	HIL-D	HSL-B	HSL-C	HSL-D	Urban Residential, Parkland and Public Open Space	Commercial Industrial
Metals								
Arsenic	500	300	3000	-	-	-	-	-
Cadmium	150	90	900	-	-	-	-	-
Chromium(VI)	150[1]	300[1]	3600[1]	-	-	-	-	-
Copper	30 000	17 000	240 000	-	-	-	-	-
Nickel	1200	1200	6000	-	-	-	-	-
Lead	1200	600	1500	-	-	-	-	-
Zinc	60 000	30 000	400 000	-	-	-	-	-
Mercury (inorganic)	120[2]	80[2]	730[2]	-	-	-	-	-
PAHs								
Carcinogenic PAHs (as B(a)P TEQ)[3]	4	3	40	-	-	-	-	-
Total PAHs[4]	400	300	4000	-	-	-	-	-
BTEX								
Benzene	-	-	-	0.5	NL	3	-	-
Toluene	-	-	-	160	NL	NL	-	-
Ethylbenzene	-	-	-	55	NL	NL	-	-
Total Xylenes	-	-	-	40	NL	NL	-	-
Naphthalene	-	-	-	3	NL	NL	-	-
TRH								
F1 C_6-C_{10}	-	-	-	45 [6,7]	NL[6,7]	260 [6,7]	700	700
F2 >C_{10}-C_{16}	-	-	-	110 [6]	NL[6]	NL	1000	1000
F3 >C_{16}-C_{34}	-	-	-	-	-	-	2500	3500
F4 >C_{34}-C_{40}	-	-	-	-	-	-	10 000	10 000
OCPs								
DDT + DDD + DDE	600	400	3600	-	-	-	-	-
Aldrin + Dieldrin	10	10	45	-	-	-	-	-
Chlordane	90	70	530	-	-	-	-	-
Endosulfan	400	340	2000	-	-	-	-	-
Endrin	20	20	100	-	-	-	-	-
Heptachlor	10	10	50	-	-	-	-	-

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

	Health Investigation Levels			Health Screening Levels[6]			Management Limits[5]	
	HIL-B	HIL-C	HIL-D	HSL-B	HSL-C	HSL-D	Urban Residential, Parkland and Public Open Space	Commercial Industrial
HCB	15	10	80	-	-	-	-	-
Methoxychlor	500	400	2500	-	-	-	-	-
Mirex	20	20	100	-	-	-	-	-
Toxaphene	30	30	160	-	-	-	-	-
PCBs								
Total PCBs	1	1	7	-	-	-	-	-
OTHER								
Asbestos (surface soils)	No visible asbestos	No visible asbestos	No visible asbestos	-	-	-	-	-
Bonded Asbestos (top 0.5 m)	0.04 %	0.02 %	0.05 %	-	-	-	-	-
Asbestos (below 0.5 m)	0.001 %	0.001 %	0.001 %	-	-	-	-	-

Notes:

[1.] Guideline values presented are for Chromium (VI) in absence of total Chromium values. Where total Chromium results are elevated, samples will be analysed for Chromium (VI).

[2.] Guideline values are for inorganic mercury. Where elevated mercury concentrations are encountered and/or site information suggests the potential presence of elemental mercury and/or methyl mercury, consideration of applicability would be needed.

[3.] Carcinogenic PAHs calculated as per Benzo(a)pyrene Toxicity Equivalent Factor requirements presented in NEPC (2013)

[4.] Total PAHs calculated as per requirements presented in NEPC (2013).

[5.] Management Limits are based on coarse grained soil, with F1 and F2 concentrations inclusive of naphthalene and BTEX compounds. Management limits will only apply where long-term containment of impacted material is proposed.

[6.] Soil Health Screening Levels for Vapour Intrusion: Coarse Soils. Values presented are those for 0 to <1 m bgl as the most conservative level. Reference should be made to results tables for further detail of levels at greater depths. NL: Non-limiting.

[7.] Values for F1 C_6-C_9 are obtained by subtracting BTEX (Sum) from laboratory result for C_6-C_9 TRH.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 8.7 Ecological Investigation and Ecological Screening Levels (all units in mg/kg)

	Ecological Investigation Levels [1]		Ecological Screening Levels [2]	
	Urban Residential/Public Open Space	Commercial/Industrial	Urban Residential/Public Open Space	Commercial/Industrial
Metals				
Arsenic	100	160	-	-
Chromium(III)	412 [3]	672 [3]	-	-
Copper	179	239	-	-
Nickel	176	296	-	-
Lead	1403	2103	-	-
Zinc	412	562	-	-
PAHs				
BaP[3]	-	-	0.7	0.7
BTEX				
Benzene	-	-	50	75
Toluene	-	-	85	135
Ethylbenzene	-	-	70	165
Total Xylenes	-	-	105	180
Naphthalene	170	370	-	-
TRH				
F1 C_6-C_{10}	-	-	180 [4]	215 [4]
F2 >C_{10}-C_{16}	-	-	120 [4]	170 [4]
F3 >C_{16}-C_{34}	-	-	300	3300
F4 >C_{34}-C_{40}	-	-	2800	6600
OCPs				
DDT	180	640	-	-
VOCs				
PCE	0.5 [5]	0.5 [5]	-	-
TCE	0.5 [5]	0.5 [5]	-	-
Cis 1,2 DCE	0.5 [5]	0.5 [5]	-	-
Trans 1,2 DCE	0.5 [5]	0.5 [5]	-	-
VC	0.5 [5]	0.5 [5]	-	-

Notes:

1. EILs calculated based on site specific data obtained from JBS&G (2017): CEC 15.75 meq/100g, pH 7.3 and % Clay 35 %.
2. ESLs based on coarse grained soils, with F1 and F2 concentrations inclusive of naphthalene and BTEX compounds.
3. Chromium values presented for chromium (III).
4. Values for F1 C_6-C_9 are obtained by subtracting BTEX (Sum) from laboratory result for C_6-C_9 TRH.
5. No EPA endorsed criteria for total soil concentrations are provided. The laboratory LOR will be used for initial screening, and where detections are reported, the soils will be subject to leachate assessment to determine whether soil-bound VOCs represent a potential groundwater migration risk. Leachate results will be assessed against groundwater assessment criteria.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 8.8 Soil-vapour Health Investigation and Screening Levels (all units in mg/m³)

	Health Investigation Levels			Health Screening Levels		
	HIL-B	HIL-C	HSL-D	Low and High Density Residential	Recreational / Public Open Space	Commercial / Industrial
VOCs						
PCE	2	40	8	-	-	
1,1,1-TCA	60	1200	230	-	-	
TCE	0.02	0.4	0.08	-	-	
Cis 1,2 DCE	0.08	2	0.3	-	-	
VC	0.03	0.5	0.31	-	-	
BTEX						
Benzene	-	-	-	1	360	4
Toluene	-	-	-	1300	NL	4800
Ethylbenzene	-	-	-	330	NL	1300
Total Xylenes	-	-	-	220	NL	840
Naphthalene	-	-	-	0.8	410	3
Petroleum Hydrocarbons						
F1 C_6-C_{10}	-	-	-	180	86 000	680
F2 >C_{10}-C_{16}	-	-	-	130	NL	500

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 8.9 Groundwater and Soil Screening Validation Criteria (all units in µg/L)

Analyte	ANZAST (2018) 95 % Species Protection	NHMRC (2017) Recreational	NEPC (2013) HSLs (High Density Residential)
Heavy Metals			
Arsenic	13	100	-
Cadmium	0.2	20	-
Chromium	1	-	-
Copper	1.4	20 000	-
Lead	3.4	100	-
Mercury	0.6	10	-
Nickel	11	200	-
Zinc	8	-	-
TRHs			
F1	-	-	NL
F2	-	-	NL
BTEX			
Benzene	950	-	5000
Toluene	-	-	NL
Ethylbenzene	-	-	NL
Xylene	550	-	NL
PAHs			
Benzo(a)pyrene	-	0.1	-
VOCs			
PCE	70	500	-
TCE	330	200	-
Cis 1,2 DCE	-	360[1]	-
VC	-	3	-

Notes:

1. Construction/recreational exposure screening criterion adopted from Region 9 RSLs US EPA (2018)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.7.1 Application of Soil Assessment Criteria

For soils proposed to be retained *in-situ* they are required to meet soil validation criteria. Soil validation criteria will apply to all soils proposed to be left at the site. The specific criteria for soils will depend on the ultimate placement location (within the proposed park, publicly accessible areas or within the high-density residential/commercial precinct) and whether any separation is proposed (above or below the marker layer) as per the following. It is noted that the following criteria are based on the anticipated site uses, where ground floor residential and/or sensitive commercial land uses (childcare centres) are proposed, more stringent soil assessment criteria may be required and should be stipulated in the relevant RWP(s).

- Soils validated *in-situ* or placed within the proposed park / green spaces are to be assessed against HIL/HSL-C, ecological and management limit validation criteria for recreational / public open space land uses;
- Soils validated *in-situ* or placed within the future commercial / residential precinct are to be assessed against HIL/HSL-D, ecological and management limit validation criteria for residential and commercial/industrial land uses.

Where elevated concentrations (exceeding investigation/screening levels presented in **Table 8.6** and **8.6**) of potentially leachable and/or volatile contaminants are identified, either further remediation of soils will be undertaken or subsequent assessment of for potential groundwater and soil-vapour generation is required:

- Elevated concentrations of potentially leachable contaminants in soils: samples with the highest reported concentrations are required to be submitted for Australian Standard Leachate Procedure (ASLP) and the resulting leachate analysed for concentrations of the identified contaminants. Leachate results will be screened against groundwater assessment criteria; and
- Elevated concentrations of volatile contaminants in soils: soil-vapour assessment is required to be completed on the residual soils in accordance with the methodology discussed in **Section 8.3.2**.

Where impacted soils are retained under a cap/cover, they are required to be assessed for potential groundwater and soil-vapour generation per the above procedure.

<u>Statistical Assessment</u>

For soils to be considered as having met the assessment criteria (i.e., not posing an unacceptable risk), the following assessment will be made:

Either:

- All contaminant concentrations were less than the adopted site assessment criteria,

Or:

- The upper 95 % confidence limit on the average concentration for each analyte (calculated for samples collected from consistent soil horizons, stratigraphy or material types) was below the adopted criterion;
- No single analyte concentration exceeded 250 % of the adopted criterion; and
- The standard deviation of the results was less than 50 % of the criterion.

In addition to the numerical criteria, the following visual observations will also supplemented the assessment process:

- No visible asbestos containing material in addition to laboratory analysis results; and

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Consideration was given to odorous or discoloured soils (caused by contamination).

8.7.2 Material Characterisation for Off-site Disposal

Where contaminated fill/soil is not suitable for onsite management or is surplus to construction requirements, materials are proposed to be remediated by off-site removal and disposal. Materials shall be classified in accordance with EPA (2014) *Waste Classification Guidelines* or an appropriate exemption as created under the *Protection of the Environment Operations (Waste) Regulation 2014*.

Given the identification of ash and slag inclusions in fill material samples with elevated total PAH and metal concentrations, the ash and slag inclusions are concluded to be a significant source of these contaminants. On this basis, it is appropriate to apply the associated NSW EPA general immobilisation approvals (EPA 1999[24] and EPA 2009[25]) when consideration is given to evaluating a waste classification(s) for material required to be excavated during the remedial works.

Material will require to be removed to a facility lawfully able to receive it.

8.7.3 Imported Materials

In accordance with current EPA policy, only material that does not represent an environmental or health risk at the receiving site may be considered for resource recovery. Imported materials will only be accepted to the site if they meet the restrictions placed on these materials and meet the definition of:

- Virgin Excavated Natural Material (VENM) as defined in the *Protection of the Environment Operations Act* (1997) Schedule 1;
- Excavated Natural Material (ENM) as defined in EPA (2014); or
- Recycled materials as per an EPA exemption.

All materials imported onto the site are required to be accompanied by appropriate documentation that has been verified by the appointed site contamination (environmental) consultant.

Sampling of materials as per an EPA exemption (recycled products) is required to be undertaken by the facility in accordance with the exemption. In addition, where materials are proposed for beneficial reuse under a NSW EPA exemption (i.e. imported to the site), fill material will need to be further assessed by The Environmental Consultant for land use suitability. Sampling densities and analysis for COPC will be dependent on the volume, material type, source and subject to Site Auditor endorsement.

8.7.4 Validation of Soil Placement Areas

Soils which are to be moved to another area of the site will be subject to the following data recording process for future reference purposes, and detailed in the MTP:

- A location plan of the placed materials with co-ordinates based on an agreed grid system (e.g., GPS or relative to the lot boundaries);
- The levels in m AHD of the base of the placement location(s) prior to the material placement;
- The levels in m AHD of the placement locations once all materials have been placed;
- The levels in m AHD of any defining layers; and

[24] *General Approval of the Immobilisation of Contaminants in Waste – Ash and Coal*. EPA 1999
[25] *General Approval of the Immobilisation of Contaminants in Waste – Metalurgical Furnace Slag*. EPA 2009

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Subsequently the total placed volume of materials.

8.7.5 Validation of Physical Separation

Qualitative review of documentation pertaining to the physical separation arrangements employed at the site will be undertaken to determine suitability for the intended purpose. Documentation will require to demonstrate, at minimum, the items identified in **Section 8.2.6.5.**

8.8 Reporting

At the completion of site remediation works, a validation report will be prepared in general accordance with EPA (2017) and OEH (2011) *Guidelines for Consultants Reporting on Contaminated Site*, documenting the works as completed.

This report will contain information including:

- Details of the area of the site which is subject to the validation assessment;
- Details of the remediation works conducted;
- Information demonstrating that the objectives of this RAP have been achieved, in particular the validation sample results and assessment of the data against both the pre-defined DQO and the remediation acceptance (validation) criteria;
- Clear statement that the remedial/validation works have been completed in accordance with the requirements of the RWP(s) and VSAQP;
- Information demonstrating compliance with appropriate regulations and guidelines;
- Any variations to the strategy undertaken during the implementation of the remedial works;
- Results of all environmental monitoring undertaken during the course of the remedial works;
- Details of any environmental incidents occurring during the course of the remedial works and the actions undertaken in response to these incidents;
- Verification of regulatory compliance;
- Details on waste classification, tracking and off-site disposal including landfill dockets;
- Clear statement of the suitability of the portion of the site which is the subject of the validation report, for the proposed use(s);
- Material tracking records which demonstrate that materials imported onsite and dispose offsite have been moved in accordance with relevant regulatory requirements; and
- Other information as appropriate, including details of EMPs (if required) that will apply to the part of the site that is the subject of the validation report.

The report will serve to document the remediation works for future reference.

Given the anticipated staged nature of site remediation, reporting, including preparation of RWP(s), EMP(s) and validation report(s) will also be staged.

8.9 Environmental Management Plan

Should validation of the site, or part thereof, identify that impacted material will remain upon completion of the works, collected data will be assessed in relation to the potential for implementation of an EMP for ongoing management of contamination risks. As per the DQO decision rule processes discussed in **Section 8**, the presence of soil impacted by contaminants of concern above the site criteria may trigger the requirement for an ongoing EMP.

Where required, the EMP shall contain the following elements:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- A statement of the objectives of the EMP – i.e., to ensure continued suitability of the site after it has been remediated;
- Identification of residual environmental contamination issues at the site that require ongoing management/monitoring to meet the EMP objectives, including the type of contamination and location within the site (including survey plans);
- Documentation of environmental management measures which have been implemented to address the identified environmental issues at within the site;
- Description of management controls to limit the exposure of the site users to known areas of contamination to acceptable levels;
- Description of responsibilities for implementing various elements of the provisions contained in the EMP;
- Timeframes for implementing the various control/monitoring, etc. elements outlined in the EMP;
- Environmental monitoring and reporting requirements (if required) for the future management of environmental impact underlying the site including:
    - Appropriate monitoring locations and depth within and down-gradient of any residual contamination;
    - Relevant assessment criteria to be used in evaluating monitoring results;
    - Frequency of monitoring and reporting;
    - Process for reviewing monitoring data and how decisions will be made regarding the ongoing management strategy;
    - The length of time for which monitoring is expected to continue;
    - The regulatory authorities involved and the management inputs required from each;
    - The integration of environmental management and monitoring measures for soil and groundwater;
    - Health and safety requirements for particular activities;
    - A program of review and audits;
    - The provisions in the EMP are feasible (i.e., able to be implemented) and able to be legally enforceable (i.e., a mechanism exists, such as development consent conditions, to give the plan a basis in law); and
    - The relevant consent authority is satisfied that the inclusion of a development consent condition relating to the implementation of the EMP is acceptable;
- Corrective action procedures to be implemented where EMP assessment criteria are breached.

The EMP will be provided to the appointed Site Auditor for review and approval prior to preparation of the SAS and SAR.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

9. Contingency Plan

A review of the proposed contamination-related aspects of the works associated with development the site has been undertaken and has identified a number of potential risks, outlined in the following sections that required the development of contingencies to ensure that the objectives of this RAP are met.

The Contingency Plan is required to be part of the REMP, as described in **Section 10**, below, and part of the Work Health and Safety Plan (WHSP), as described in **Section 10**.

9.1 Unexpected Finds

The possibility exists for hazards that have not been identified to date to be present within fill materials or underlying pavements/building on the site. The nature of hazards which may be present and which may be discovered at the site are generally detectable through visual or olfactory means, for example:

- The presence of significant aggregates of friable asbestos materials (visible) as opposed to minor occurrences of fragments or fibre bundles in soil; and/or
- Excessive quantities of Construction/Demolition Waste (visible); and/or
- Hydrocarbon impacted materials (visible/odorous); and/or
- Drums, waste pits, former pipework or USTs (visible); and/or
- Oily Ash and/or oily slag contaminated soils/fill materials (visible/odorous); and/or
- Tarry like impacted soil/fill material (visible/odorous); and/or
- Potential chlorinated hydrocarbon impact (sweet odour soils).

As a precautionary measure to ensure the protection of the workforce and surrounding community, should any of the abovementioned substances (or any other unexpected potentially hazardous substance) be identified, the procedure summarised in **Figure 9.1** is to be followed.

An enlarged version of the Unexpected Finds Protocol, suitable for use on the site, should be posted in the Site Office and referred to during the site-specific induction by the Principal Contractor.

The sampling strategy for each “unexpected find” shall be designed by a suitably qualified environmental consultant. The strategy will, however, be aimed at determining the nature of the substance – that is, is it hazardous and, if so, is it at concentrations which pose an unacceptable risk to human health or the environment.

The sampling frequency of the identified substance/materials shall meet the minimum requirements outlined in EPA (1995) in addition to those outlined in **Section 8**.

9.1.1 Change in Development Plans

In the event that the development plans are changed from those available at the time of preparation of this RAP, particularly where changes in nominated land use, basements to intercept impacted groundwater or beneficial reuse of groundwater, consideration of the suitability of the proposed remedial strategy will be required.

Development plans should be reviewed in detail to identify any inconsistencies with the assumptions presented herein, and those inconsistencies addressed in site-specific RWPs, as discussed in **Section 10.1**.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

9.1.2 Identification of Additional Underground Storage Tank

There is the potential that one or more additional USTs may be encountered during demolition of the pavements or subsequent earthworks. In the event of such an occurrence, the Unexpected Finds Protocol as discussed below (**Figure 9.1**) will be implemented.

9.1.3 Identification of Oily or Tarry Materials

In the event that oily/tarry materials are encountered, the provisions outlined in the Unexpected Finds Protocol will be implemented, comprising inspection, testing and appropriate action as advised by the Field Scientist (**Figure 9.1**).

Any suspected oily/tarry materials must be segregated from other excavated materials and placed in a designated area with appropriate odour and sediment controls until such time as appropriate assessment is completed and a methodology is confirmed for their appropriate management. In the event that the oily/tarry materials do not meet the site validation criteria, then they shall be stored in a secure area for later treatment or classified and removed from the site for treatment and/or disposal at an appropriately licensed facility.

9.1.4 Identification of Chlorinated Hydrocarbon Impact

In the event that chlorinated hydrocarbon impacted materials are encountered outside of the remedial area presented in **Figure 6** (potentially as a result of the identification of sweet odours in soils), the provisions outlined in the Unexpected Finds Protocol will be implemented, comprising inspection, testing and appropriate action as advised by the Field Scientist (**Section 9.1**).

Any suspected chlorinated hydrocarbon impacted materials must be segregated from other excavated materials and placed in a designated area with appropriate odour and sediment controls until such time as appropriate assessment is completed and a methodology is confirmed for their management. In the event that the materials do not meet the site validation criteria, then they shall be stored in a secure area for later treatment or classified and removed from the site for treatment and/or disposal at an appropriately licensed facility.

9.1.5 Material Storage Breach

In the event that any materials storage containment controls are breached and stockpiled materials classified as asbestos contaminated soil or otherwise have escaped (or have the potential to escape), then the management controls shall be rectified and investigations undertaken to review the adequacy of the controls and any improvements implemented. The REMP (**Section 10**) shall include a documented process for identifying and responding to such incidents.

9.1.6 Emissions Complaints

Due to the nature of the activities and type of contaminants identified within the site, there is a potential for complaints to be received from members of the public and/or occupants of surrounding properties relating to environmental emissions including:

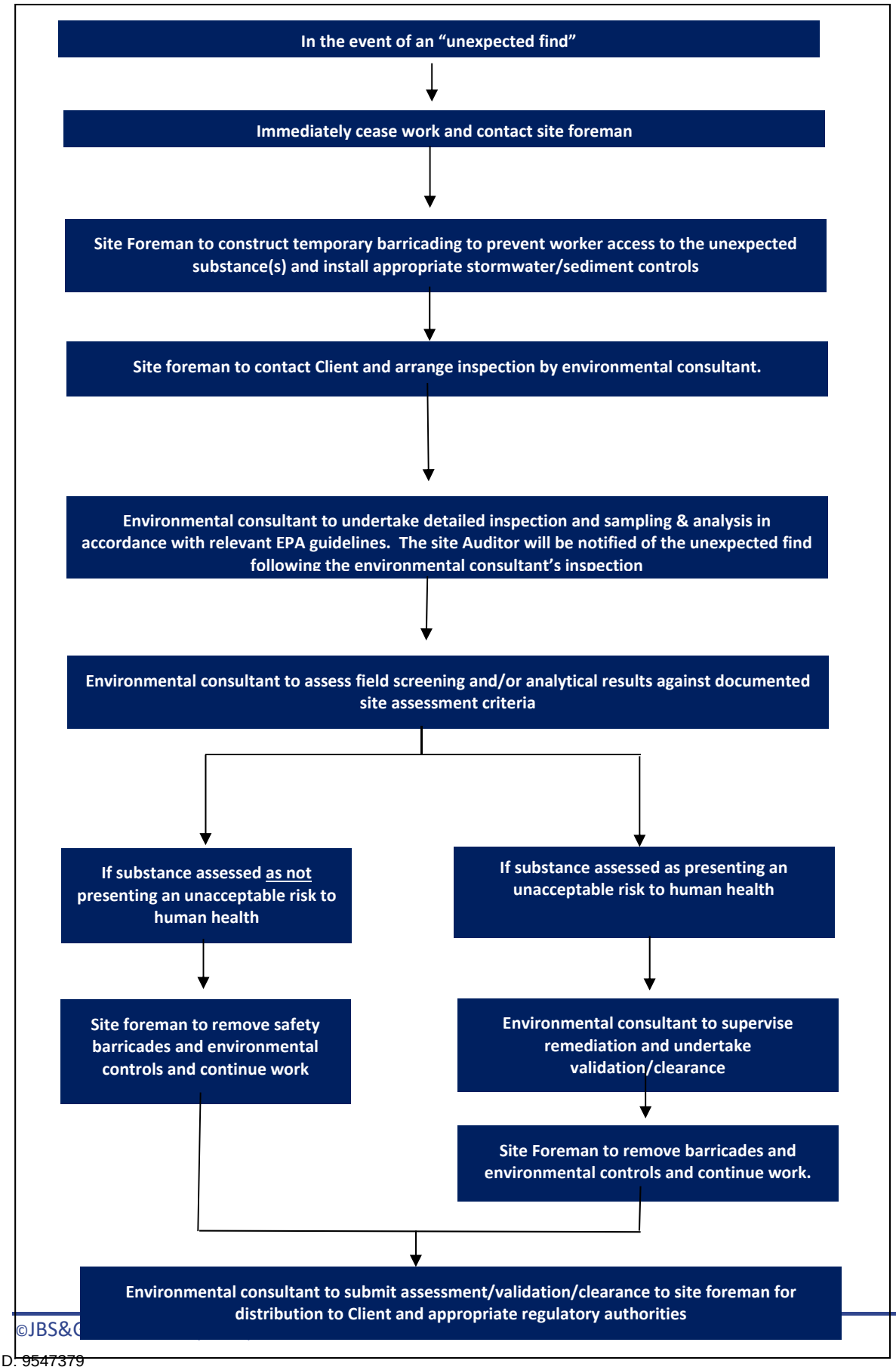
- Odour emissions arising from handling of malodorous soil;
- Noise and vibration arising from excavation, piling and other works;
- Dust emissions arising from excavation, material handling and placement; and
- Visibly impacted water quality in surface water discharge from the site.

Monitoring of all environmental emissions shall be undertaken during the works as detailed in the REMP (discussed in **Section 10**) and appropriate actions taken to further control emissions following receipt of a complaint. The REMP shall contain provision for contingency actions where excessive emissions occur, however it is anticipated that one or more of the following actions will be considered:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Increased application of odour screening/masking chemicals on odorous materials;
- Disturbance of soils during meteorologically favourable periods only; and/or
- Covering of impacted soils.

Figure 9.1 - Unexpected Finds Protocol



Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

10. Other Remediation Documents

10.1 Remedial Works Plans

As the proposed redevelopment / remediation staging becomes available, stage specific RWPs are required to be prepared. The RWPs will document the stage specific development details and identify any outstanding data gaps which are required to be addressed prior to implementation of the RWP. The RWPs will at least require:

- Identification of areas requiring additional environmental assessment including:
  - The extent of the area;
  - The required assessment method and proposed sampling locations (if appropriate);
  - Constituents of potential concern; and
  - Data quality objectives for validation of the area.
- Identification of areas requiring containment and proposed method of containment;
- Identification of areas of known / potential petroleum hydrocarbon impact and proposed remediation / treatment / disposal method;
- Validation methods and requirements for implementation of capping and treatment of petroleum hydrocarbon impacted soils;
- An UFP;
- An environmental management plan (EMP) to control potential emissions from remediation works. This should be particularly cognisant of particulates with elevated levels of PAHs and asbestos fibres;
- A Work Health and Safety Plan (WHSP) to be applied during the course of the remedial works to assess potential health and safety risks, appropriate measures to mitigate these risks and associated monitoring to assess actual risks;
- A Community Consultation Plan to notify all stakeholders including occupiers of neighbouring properties of the activities on the site; and
- The requirements for any long term/ongoing Environmental Management Plans to be applied long term after the completion of remediation / management works. Identification of the requirement, and associated validation, of any materials to be imported to/exported from site.

10.2 Environmental Management

10.2.1 Preparation of a Remediation Environmental Management Plan

Prior to commencement of remediation works, a REMP shall be prepared by the Principal Contractor or the Principal Contractors Remediation Contractor, which documents the environmental monitoring and management measures required to be implemented during the remediation and construction related activities associated with the construction of the site.

The REMP shall address each of the nominated items in **Section 10.2.2** and shall include the Contingency Plan, referred to in **Section 9**, above. Additional environmental management requirements may be required as part of development consent.

10.2.2 Required Elements/Procedures

An assessment of the proposed activities and the associated elements required to be incorporated into the REMP is provided in **Table 10.1**. The REMP is required to address each of the required

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

elements and procedures in full detail and to include detailed monitoring processes and procedures, corrective actions and reporting requirements.

Table 10.1 Required Elements of the REMP

Element	Specific Minimum Requirements to be included in REMP
1. Dust and Airborne Hazard Control	Dust and asbestos air monitoring. Provisions for dust control based on monitoring results.
2. Flora and Fauna	As appropriate.
3. Heritage/Archaeological	In accordance with relevant heritage/archaeological studies.
4. Visual Impacts	Visual monitoring at site boundary Specific colour requirements for various controls/measures, including PPE (e.g., navy coveralls)
5. Emergency Response	As appropriate. Procedures required for spill incident response including material storage breach.
6. Noise Control	Hours of operation, consistent with the consent conditions. Boundary monitoring at commencement of work site activities with Procedures for control and management of noise emissions, as appropriate (e.g., restricted hours).
7. Traffic	Controls on vehicle movements on public roads. Controls on transport of tar impacted materials.
8. Protection of Adjoining Structures	As appropriate.
9. Odour Control and Volatile Contaminant Exposure	Management of all potential gaseous phase volatile contaminant generating activities (i.e., excavation of VOC contaminated soils and treatment) with appropriate vapour controls incorporating safeguards and monitoring. Daily monitoring of odour levels at site boundary during handling of malodorous materials. Procedures for addressing elevated odour monitoring results, including, but not limited to: reduction in earthworks activities within odorous material areas during adverse meteorological conditions; application of odour masking solutions at the odour source or between identified source(s) and receptor(s); review of bio-pile operation and covering identified potential odour sources by hydro-mulching or with less odorous materials.
10. Handling of Contaminated Soil and Groundwater	Soil and water management (stockpiling, site access, excavation pump out, reinstatement).
11. Soil Storage/Placement Areas	Soil and water management (stockpiling, site access, excavation pump out, reinstatement). Bunding. Heavy vehicle/personnel decontamination. Interim storage requirements for materials requiring later treatment. Site drainage requirements, incorporating clean/dirty areas and modifications to existing surface water and drainage controls beneath retained pavements. Monitoring as required.
12. Sediment Control	Bunding. Collection/treatment/handling impacted sediments.
13. Operation of Site Office	As appropriate.
14. Decontamination of Heavy Equipment	As appropriate.
15. Environmental Monitoring	Monitoring of dusts, noise, odour and fibres. Monitoring as required for vibration and water releases. Inspection checklists and field forms. Monitoring within the Locomotive Workshop is required as per the requirements of the EMP and HHRA.
16. Environmental Criteria	Soil and water criteria as presented in this RWP
17. Material Classification	As detailed in this RWP. Materials tracking, including QA/QC inspection and sampling.
18. Community Relations Plan	Specific communication protocols, incorporating nomination of specific contact persons & details and requirements for communications/response register.
19. Incident Reporting	As appropriate, including standard form/checklist.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Element	Specific Minimum Requirements to be included in REMP
20. Security and Signage	Secure site perimeter. Site boundary signage.
21. EMP Review	As appropriate.
22. Training	As appropriate.
23. Contact Details	Company/personnel details, including names/phone numbers for: - Principal Contractor - Site Auditor - Remediation Consultant - Remediation Contractor - OH&S Compliance - Environmental Compliance
24. Stockpiling	All materials stockpiled onsite will be managed by the Remedial Contractor. Unique identification will be provided for each stockpile, the source of the stockpile, its estimated volume, material characterisation and its location onsite (via GPS) will also be recorded consistent with the Material Tracking Plan provided as **Section 8.6.12**. The following procedures will be implemented by the Remedial Contractor: No stockpiles of soil or other materials shall be placed on footpaths or nature strips unless prior Council approval has been obtained; All stockpiles of soil or other materials shall be placed away from drainage lines gutters or stormwater pits or inlets; All stockpiles of soil or other materials likely to generate dust or odours shall be covered; All stockpiles of chemically contaminated soil shall be stored in a secure area and be covered if remaining more than 24 hours; and All stockpiles of asbestos contaminated soils shall be kept damp and covered to minimise potential fibre release, and if left for more than 24 hours, be stored in a secure area.

10.2.3 Certification

Prior to commencement of remediation works, the Remediation Contractor is required to have the REMP endorsed as acceptable by the Environmental Consultant and Site Auditor appointed to validate the works.

A copy of the REMP and the endorsement to the satisfaction of Environmental Consultant or Site Auditor are required to be provided by the Principal Contractor/Remedial Contractor prior to commencement of remediation works.

10.2.4 Hours of Site Operation/Duration of Works

Remediation works shall be completed in accordance with the permissible hours of work and noise as nominated in of the Development Consent.

The appointed remediation contractor will be required to include a proposed schedule of remediation works within the REMP submitted for endorsement as discussed above.

Typical working hours presented following:

- Monday to Friday: 7am to 5pm; and
- Saturday: 8am to 1pm.

10.3 Health and Safety

10.3.1 Work Health and Safety Management Plan

A WHSP shall be prepared by the Remediation Contractor prior to commencement of remediation works. The Plan shall contain procedures and requirements that are to be implemented as a minimum during the works, in addition to the Contingency Plan, referred to in **Section 9**.

The objectives of the WHSP are:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- To apply standard procedures that minimises risks resulting from the works;
- To ensure all employees are provided with appropriate training, equipment and support to consistently perform their duties in a safe manner; and
- To have procedures to protect other site workers and the general public.

These objectives will be achieved by:

- Assignment of responsibilities;
- An evaluation of hazards;
- Establishment of personal protection standards, mandatory safety practices and procedures;
- Monitoring of potential hazards and implementation of corrective measures; and
- Provision for contingencies that may arise while operations are being conducted within the site.

10.3.2 Additional Site-Specific Elements/Procedures

In addition to the normal construction-related matters, the WHSP shall address the following site-specific specific hazards associated with the works relating to the management of contaminated soil and groundwater:

- Under/aboveground services, specifically potential petroleum infrastructure;
- Use of plant and machinery within confined spaces (i.e. tank pit excavations);
- Contact to asbestos contaminated soils, including friable asbestos;
- Contact with contaminated soil (heavy metals, TRH and PAHs), groundwater and vapours, including requirements for specific Personal Protective Equipment (PPE); and
- Heat/cold stress.

10.3.3 Asbestos

The WHSP will include an overview of the asbestos management plan (AMP) and shall comply with relevant NSW regulations.

During the remedial works, perimeter asbestos in air monitoring will be conducted at each applicable remedial works area boundary when soils with asbestos are being disturbed. Air monitoring will be conducted on a daily basis at relevant locations whilst disturbance of asbestos contaminated areas takes place.

Air monitoring will be conducted during any ground disturbance activities within impacted soil within the site to verify that implementation of appropriate control measures have been successful at managing the risk of air borne fibre generation. Air monitoring will be undertaken in accordance with the requirements of the National Occupational Health and Safety Commission (NOHSC) Asbestos Code of Practice and Guidance Notes, in particular the *Guidance note for the estimation of airborne asbestos dust* [NOHSC 3002:2005].

10.3.4 Additional Consideration of Chemical Contaminants

In addition to general assessment of the potential for exposure to chemical contaminants the WHSP should also include specific consideration of additional contaminants such as chlorinated hydrocarbon impacts to soils and lead and PAHs distributed throughout fill materials.

Volatile organic compound concentrations in air should be actively monitored throughout remediation works and any time that workers disturb potentially impacted soils. The services of an occupational hygienist are required full time during impacted soil disturbance activities to determine

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

the controls required to minimise potential health/safety risks to an acceptable level. When working with contaminated materials in general, care needs to be taken to ensure that the contamination is not introduced to the worker via ingestion, inhalation or absorption. The WHSP must detail the PPE and decontamination requirements to be followed to control the risks posed by potential exposure to chemical contaminants at/within the site.

As a precautionary measure, the WHSP should include the requirement for the plan to be revised in the event of an unexpected find of contaminated material during remediation and/or construction.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

11. Conclusions and Recommendations

11.1 Conclusions

Overall, it is considered that the proposed actions outlined in this RAP conform to the requirements of the *Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme (3rd Edition)* (EPA 2017) because they are: technically feasible; environmentally justifiable; and consistent with relevant laws policies and guidelines endorsed by NSW EPA.

Subject to the successful implementation of the measures described in this RAP and the recommendations below, it is concluded that the site can be made suitable for the intended uses and that the risks posed by contamination can be managed in such a way as to be adequately protective of human health and the environment.

11.2 Recommendations

It is recommended that the processes outlined in this RAP be utilised to inform site specific RWPs and subsequently implemented, and that the following documentation be developed and implemented to ensure the risks and impacts during remediation works are controlled in an appropriate manner:

- Individual stage RWPs;
- A REMP, to document the monitoring and management measures required to control the environmental impacts of the works and ensure the validation protocols are being addressed; and
- A WHSP to document the procedures to be followed to manage the risks posed to the health of the remediation workforce.

During the period preceding remediation of the site, ongoing monitoring of potential risks to site receptors shall be completed in accordance with JBS&G (2019c[26])

The REMP and WHSP will require to be cognisant of the potential occurrence and storage/handling of asbestos contaminated soils.

Upon completion of the works, or within various specific areas, validation report(s) are required to be submitted by the Remediation Consultant to the Site Auditor for certification that the site, or relevant portion(s) are suitable for the proposed uses.

[26] *Penrith Central Park – Environmental Monitoring Plan*. JBS&G Australia dated 1 March 2019 Reference 55073/110468, JBS&G (2019c)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

12. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

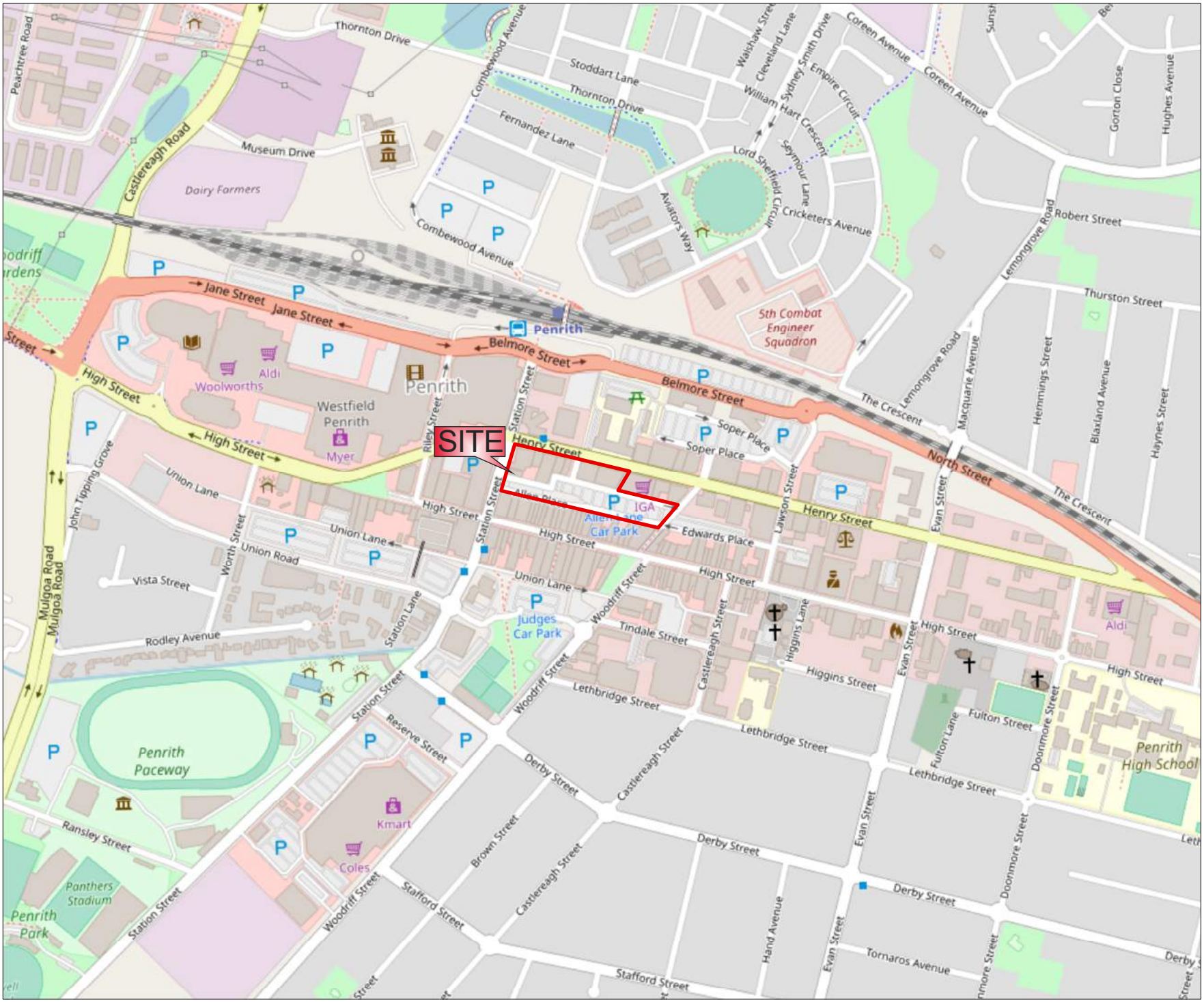
Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figures

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



Legend:

Approximate Site Boundary

JBS&G

Job No: 55073	
Client: Penrith City Council	
Version: R02 Rev A	Date: 16-Nov-2018
Drawn By: AV	Checked By: RH

Scale 1:8,500

0 100 200

metres

Coor. Sys. GDA 1994 MGA Zone 56

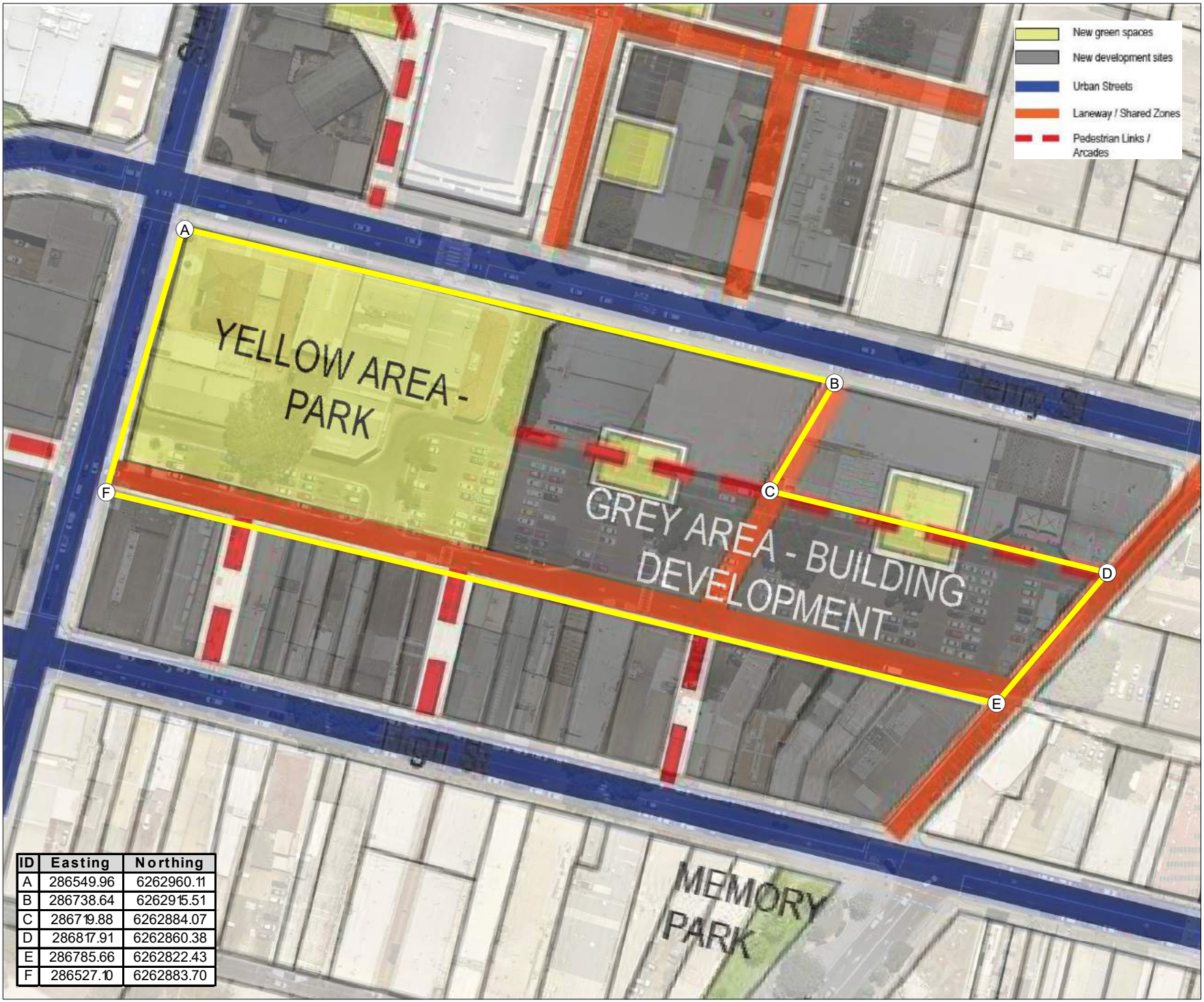
114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

SITE LOCATION

FIGURE 1

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Reference: © OpenStreetMap (and) contributors, CC-BY-SA



ID	Easting	Northing
A	286549.96	6262960.11
B	286738.64	6262915.51
C	286719.88	6262884.07
D	286817.91	6262860.38
E	286785.66	6262822.43
F	286527.10	6262883.70

Legend:

Approximate Site Boundary

JBS&G

Job No: 55073

Client: Penrith City Council

Version: R02 Rev A | Date: 16-Nov-2018

Drawn By: AV | Checked By: RH

Scale 1:1,500

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

DEVELOPMENT SITE LAYOUT

FIGURE 2

Path: G:\Projects\55073 Penrith City Council\55073 Central Park Village Overarching RAP\04 GIS\Maps\R02 Rev A\55073_02_SiteLay.mxd
Reference: Near Map www.nearmap.com, imagery date 20-01-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Approximate Site Boundary
- Sewerage Infrastructure / Preferential Pathway
- 134-138 Henry Street
- 118-120 Henry Street
- Transformer Location

JBS&G

Job No: 55073

Client: Penrith City Council

Version: R02 Rev A	Date: 20-Nov-2018
Drawn By: AV	Checked By: RH

Scale 1:1,000

0 10 20
metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

SITE LAYOUT AND AREAS OF ENVIRONMENTAL CONCERN

FIGURE 3

J:\Projects\55073 Penrith City Council\55073 Central Park Village Overarching RAP\04 GIS\Maps\R02 Rev A\55073_03_AreasEnvConcern.mxd
Reference: Near Map www.nearmap.com, imagery date 20-01-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Approximate Site Boundary
- Approximate Lot Boundary

Sample Location

- PSM Groundwater Monitoring Well
- JBS&G Groundwater Monitoring Well
- JBS&G Borehole
- JBS&G Hand Auger

JBS&G

Job No: 55073	
Client: Penrith City Council	
Version: R02 Rev A	Date: 20-Nov-2018
Drawn By: AV	Checked By: RH

Scale 1:1,500

0 20 40

metres

Coor. Sys. GDA 1994 MGA Zone 56

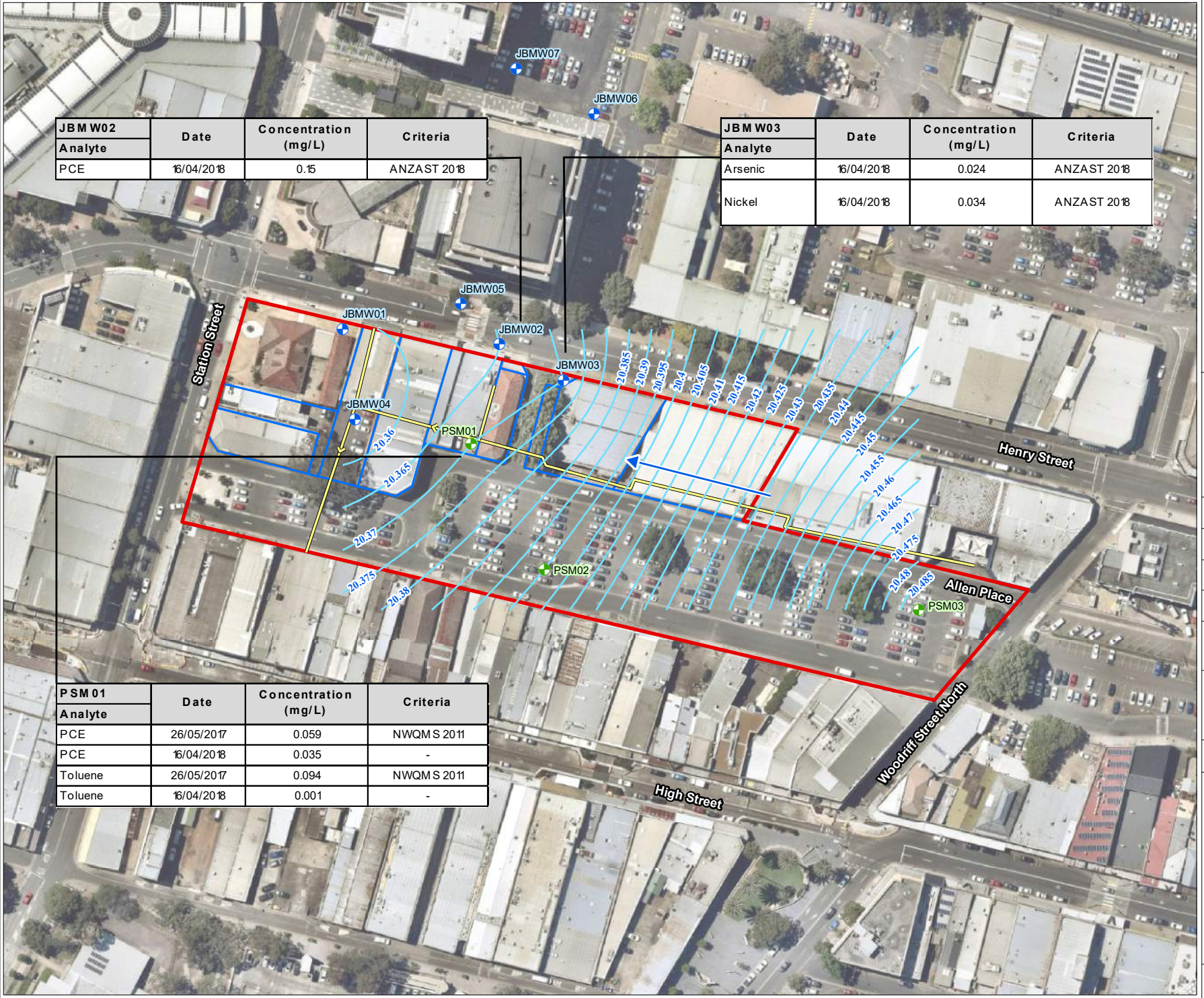
114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

HISTORICAL SOIL SAMPLE LOCATIONS AND TIER 1 EXCEEDANCES

FIGURE 4A

Document Path: C:\Projects\55073 Penrith City Council\55073 Central Park Village Overarching RAP\04 GIS\Maps\R02 Rev A\55073_04A_HistoricalSoilSamples.mxd
Reference: Near Map www.nearmap.com, imagery date 30-10-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



JBMW02 Analyte	Date	Concentration (mg/L)	Criteria
PCE	16/04/2018	0.15	ANZAST 2018

JBMW03 Analyte	Date	Concentration (mg/L)	Criteria
Arsenic	16/04/2018	0.024	ANZAST 2018
Nickel	16/04/2018	0.034	ANZAST 2018

PSM01 Analyte	Date	Concentration (mg/L)	Criteria
PCE	26/05/2017	0.059	NWQMS 2011
PCE	16/04/2018	0.035	-
Toluene	26/05/2017	0.094	NWQMS 2011
Toluene	16/04/2018	0.001	-

Legend:

- Approximate Site Boundary
- Approximate Lot Boundary
- Sewerage Infrastructure / Preferential Pathway
- Groundwater Contours (m AHD)
- Inferred Groundwater Flow Direction

Sample Location

- PSM Well
- JBS&G Groundwater Monitoring Well

JBS&G

Job No: 55073

Client: Penrith City Council

Version: R02 Rev A | Date: 19-Nov-2018

Drawn By: AV | Checked By: RH

Scale 1:1,750

0 20 40
metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

GROUNDWATER WELL LOCATIONS, TIER 1 EXCEEDANCES & INFERRED GROUNDWATER FLOW DIRECTION

FIGURE 4B

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Reference: Near Map www.nearmap.com, imagery date 30-10-2018

Legend:

- Approximate Site Boundary
- Approximate Lot Boundary
- Sewerage Infrastructure / Preferential Pathway

Sample Location

- JBS&G Soil Vapour

JBS&G

Job No: 55073

Client: Penrith City Council

Version: R02 Rev A	Date: 16-Nov-2018
Drawn By: AV	Checked By: RH

Scale 1:1,500

0 20 40

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

SOIL VAPOUR SAMPLE LOCATIONS & TIER 1 EXCEEDANCES

FIGURE 4C

Path: J:\Projects\55073 Penrith City Council\55073 Central Park Village Overarching RAP\04 GIS\Maps\R02 Rev A\55073_04C_SoilVapour.mxd
Reference: Near Map www.nearmap.com, imagery date 20-01-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Approximate Site Boundary
- Approximate Lot Boundary
- Former Dry Cleaner
- 1/134-138 Henry Street
- Shop 3 - 140 Henry Street
- External Alleyway
- Sewerage Infrastructure / Preferential Pathway

Investigation Locations

- JBS&G Ambient Air Sample
- JBS&G Soil Vapour

JBS&G

Job No: 55073

Client: Penrith City Council

Version: R02 Rev A	Date: 16-Nov-2018
Drawn By: AV	Checked By: RH

Scale 1:400

0 5 10
metres

Coor. Sys. GDA 1994 MGA Zone 56

Shop 3 of 134-138 and 140 Henry Street, Penrith, NSW

134-138 & 140 HENRY STREET FLOOR PLAN & VAPOUR SAMPLE LOCATIONS

FIGURE 4D

Document Path: C:\Users\rhall\Documents\Projects\55073 Central Park Village Overarching RAP\04 GIS\Maps\R02 Rev A\55073_04D_FloorPlan.mxd
Reference: Near Map www.nearmap.com, imagery date 20-01-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

Approximate Site Boundary

Depth of Fill

Value

1.9

0.7

0.15

JBS&G

Job No: 55073

Client: Penrith City Council

Version: R02 Rev A	Date: 20-Nov-2018
Drawn By: AV	Checked By: RH

Scale 1:1,500

0 10 20

metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

DEPTH OF FILL MODEL

FIGURE 5

J:\Projects\55073 Penrith City Council\55073 Central Park Village Overarching RAP\04 GIS\Maps\R02 Rev A\55073_05_DepthFill.mxd

Reference: Near Map www.nearmap.com, imagery date 30-10-2018

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Legend:

- Approximate Site Boundary
- Sewerage Infrastructure / Preferential Pathway
- Approximate Lot Boundary
- AEC 1- Dry Cleaners Location
- AEC 2- Former Service Station Location
- Transformer

Contamination Impacts

- Former Service Station
- Inferred VOC Source Zone
- Trace Asbestos in Soil

JBS&G

Job No: 55073

Client: Penrith City Council

Version: R02 Rev A	Date: 06-Jun-2018
Drawn By: AV	Checked By: RH

Scale 1:1,400

0 10 20
metres

Coor. Sys. GDA 1994 MGA Zone 56

114 - 146 Henry Street and Allen Place Carpark, Penrith, NSW

CONTAMINATION IMPACTS

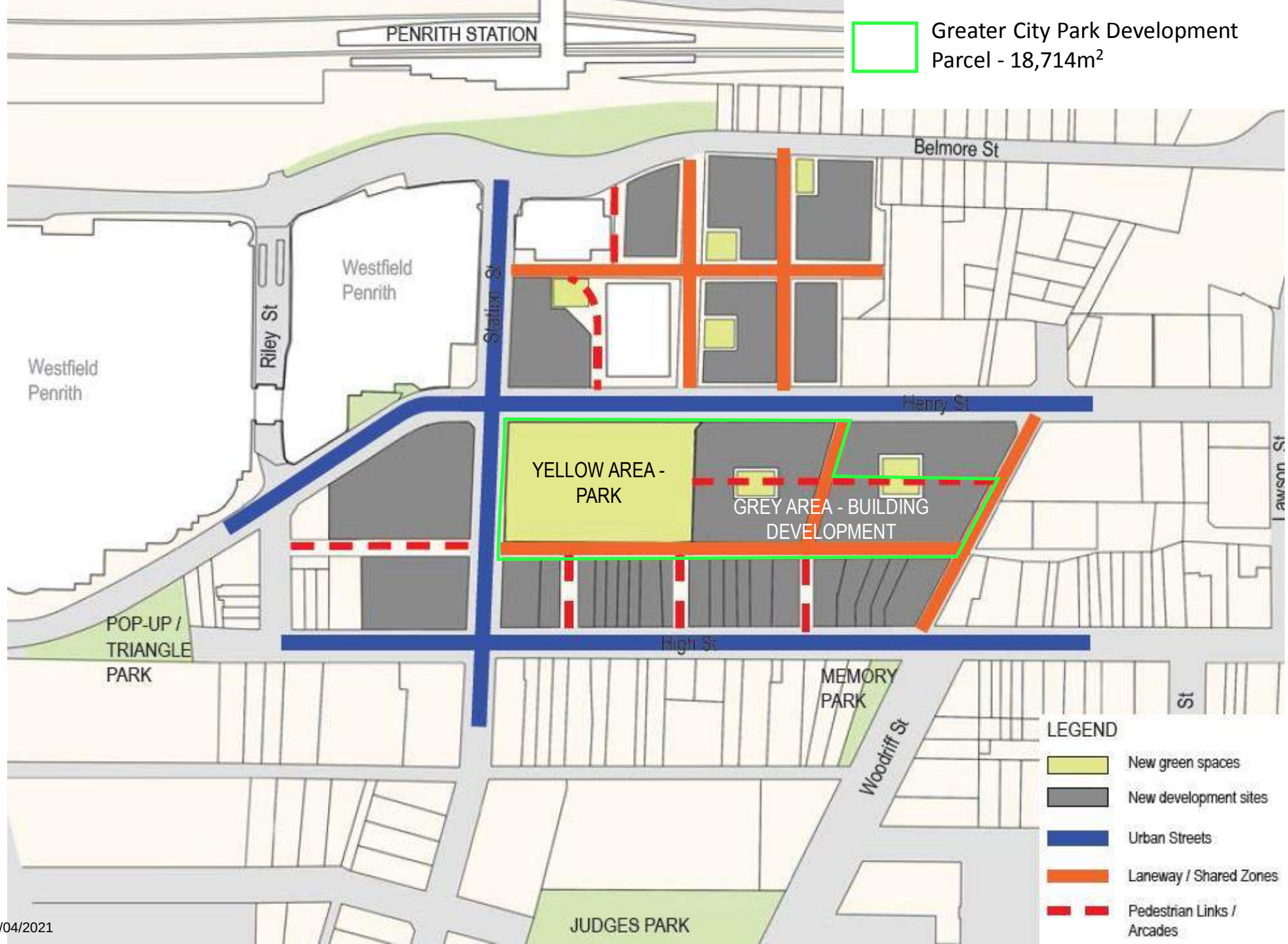
FIGURE 6

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix A Design Plans

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021



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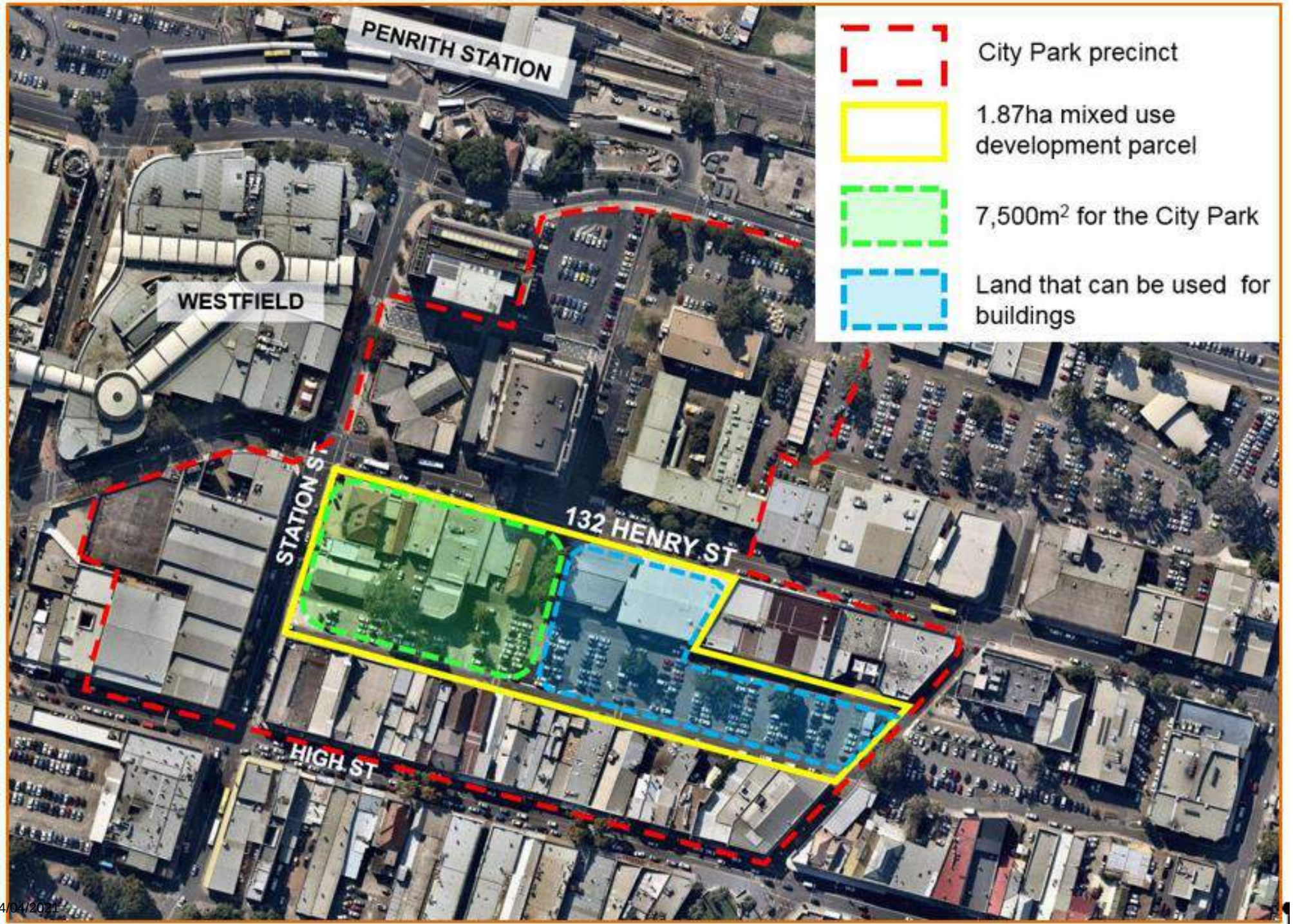

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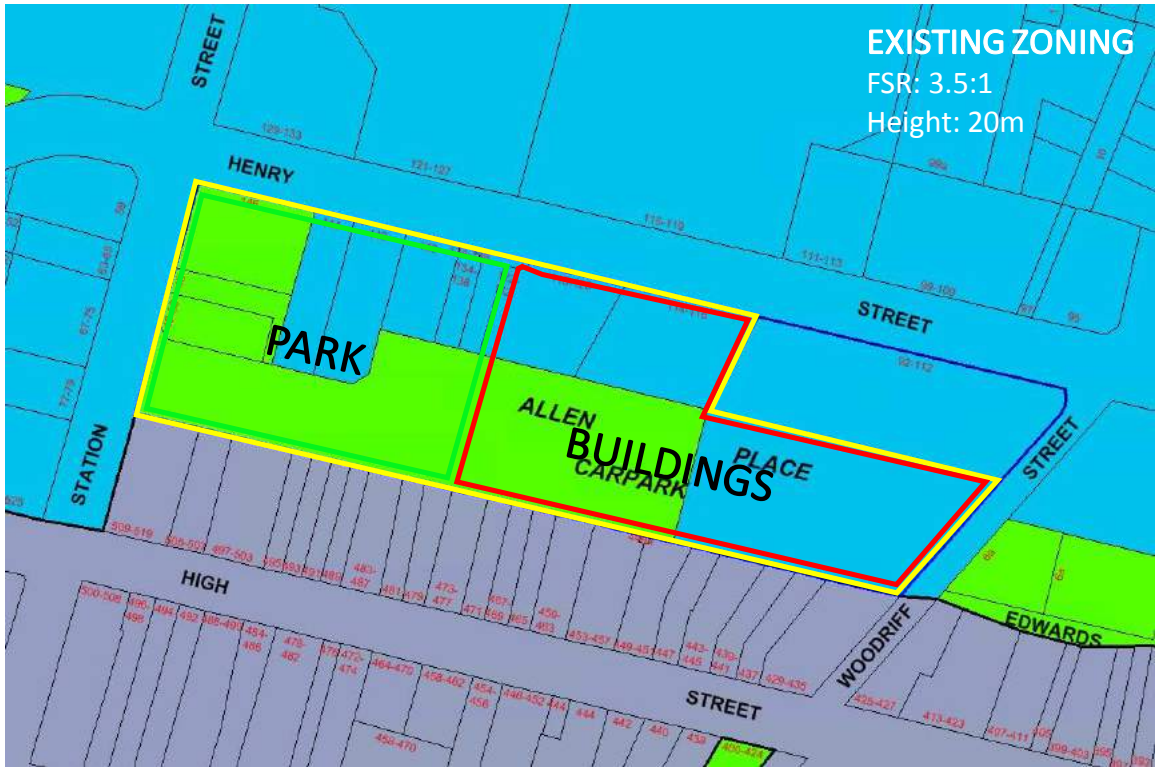

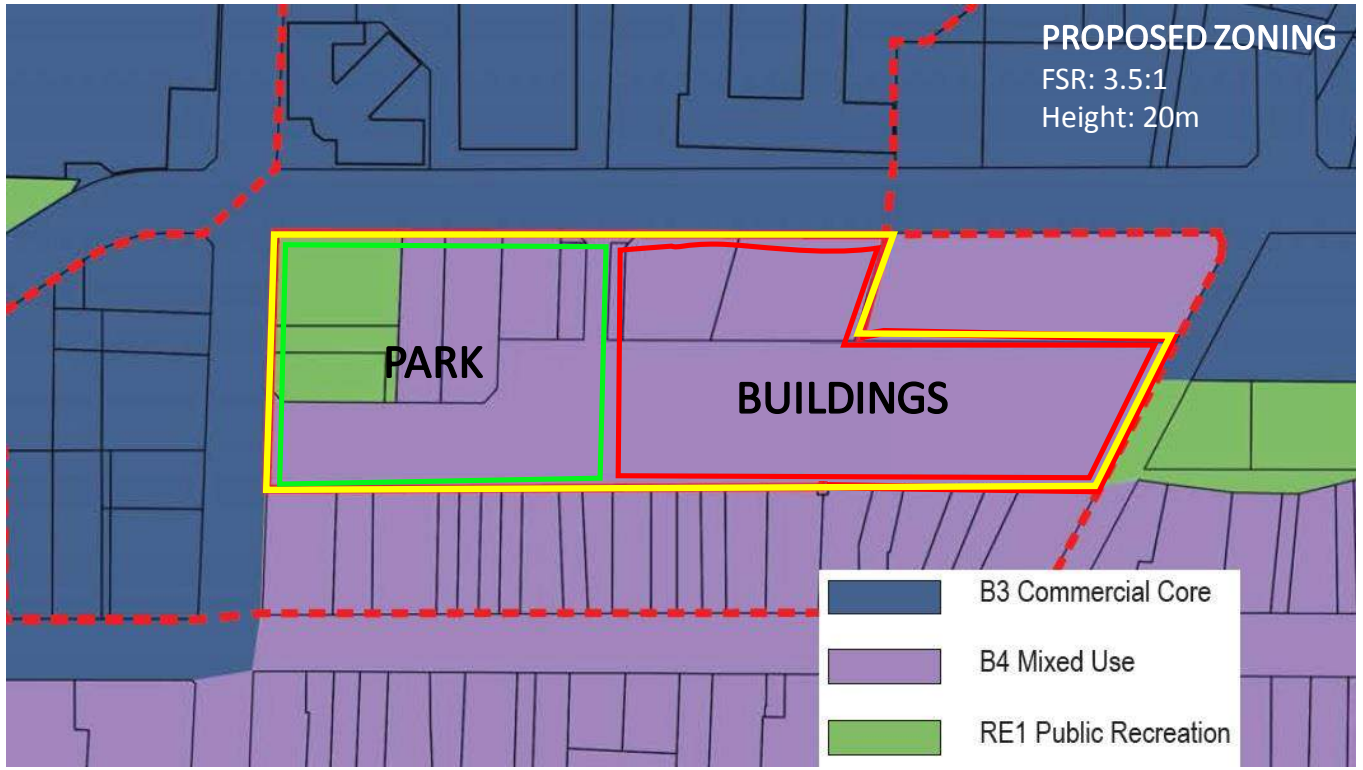

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix B EPA Searches

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Home Contaminated land Record of notices

Search results

Your search for:Suburb: PENRITH

Matched 6 notices relating to 1 site.

Search Again

Refine Search

Suburb	Address	Site Name	Notices related to this site
PENRITH	Castlereagh ROAD	Crane Enfield Metals	3 current and 3 former

Page 1 of 1

12 February 2018

For business and industry ()

For local government ()

Contact us

131 555 (tel:131555)

Online (http://www.epa.nsw.gov.au/about-us/contact-us/feedback/feedback-form)

info@epa.nsw.gov.au (mailto:info@epa.nsw.gov.au)

EPA Office Locations (http://www.epa.nsw.gov.au/about-us/contact-us/locations)

Accessibility (http://www.epa.nsw.gov.au/about-us/contact-us/website-service-standards/help-index)
Disclaimer (http://www.epa.nsw.gov.au/about-us/contact-us/website-service-standards/disclaimer)
Privacy (http://www.epa.nsw.gov.au/about-us/contact-us/website-service-standards/privacy)
Copyright (http://www.epa.nsw.gov.au/about-us/contact-us/website-service-standards/copyright)

Find us on (https://www.linkedin.com/company/epansw)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

List of NSW Contaminated Sites Notified to EPA as of 22 December 2017

Background

A strategy to systematically assess, prioritise and respond to notifications under Section 60 of the *Contaminated Land Management Act 1997* (CLM Act) has been developed by the EPA. This strategy acknowledges the EPA's obligations to make information available to the public under *Government Information (Public Access) Act 2009*.

When a site is notified to the EPA, it may be accompanied by detailed site reports where the owner has been proactive in addressing the contamination and its source. However, often there is minimal information on the nature or extent of the contamination.

For some notifications, the information indicates the contamination is securely immobilised within the site, such as under a building or carpark, and is not currently causing any offsite consequences to the community or environment. Such sites would still need to be cleaned up, but this could be done in conjunction with any subsequent building or redevelopment of the land. These sites may not require intervention under the CLM Act, but could be dealt with through the planning and development consent process.

Where indications are that the nominated site is causing actual harm to the environment or an unacceptable offsite impact (i.e. it is a "significantly contaminated site"), the EPA would apply the regulatory provisions of the CLM Act to have the responsible polluter and/or landowner investigate and remediate the site.

As such, the sites notified to the EPA and presented in the following table are at various stages of the assessment and/or remediation process. Understanding the nature of the underlying contamination, its implications and implementing a remediation program where required, can take a considerable period of time. The tables provide an indication, in relation to each nominated site, as to the management status of that particular site. Further detailed information may be available from the EPA or the responsible landowner.

The following questions and answers may assist those interested in this issue:

Frequently asked questions

What is the difference between the "List of NSW Contaminated Sites Notified to the EPA" and the "Contaminated Land: Record of Notices"?

A site will be on the Contaminated Land: Record of Notices only if the EPA has issued a regulatory notice in relation to the site under the *Contaminated Land Management Act 1997*.

The sites appearing on this "List of NSW contaminated sites notified to the EPA" indicate that the notifiers consider that the sites are contaminated and warrant reporting to the EPA. However, the contamination may or may not be significant enough to warrant regulation by the EPA. The EPA needs to review and, if necessary, obtain more information before it can make a determination as to whether the site warrants regulation.

Why my site appears on the list?

Your site appears on the list because of one or more of the following reasons:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- The site owner and/or the person partly or fully responsible for causing the contamination notified to the EPA about the contamination under Section 60 of the *Contaminated Land Management Act 1997*. In other words, the site owner or the "polluter" believes the site is contaminated.
- The EPA has been notified via other means and is satisfied that the site is or was contaminated.

Does the list contain all contaminated sites in NSW?

No. The list only contains contaminated sites that the EPA is aware of, with regard to its regulatory role under the CLM Act. An absence of a site from the list does not necessarily imply the site is not contaminated.

The EPA relies upon responsible parties to notify contaminated sites.

How are these notified contaminated sites managed by the EPA?

There are different ways that the EPA manages these notified contaminated sites. First, an initial assessment is carried out by the EPA. At the completion of the initial assessment, the EPA may take one or more than one of the following management approaches:

- The contamination warrants the EPA's direct regulatory intervention either under the *Contaminated Land Management Act 1997* or the *Protection of the Environment Operations Act 1997* (POEO Act), or both. Information about current or past regulatory action on this site can be found on EPA website.
- The contamination with respect to the current use or approved use of the site, as defined under the *Contaminated Land Management Act 1997,* is not significant enough that it warrants EPA regulation.
- The contamination does not require EPA regulation and can be managed by a planning approval process.
- The contamination is related to an operational Underground Petroleum Storage System, such as a service station or fuel depot. The contamination may be managed under the POEO Act and the Protection of the Environment Operation (Underground Petroleum Storage Systems) Regulation 2008.
- The contamination is being managed under a specifically tailored program operated by another agency (for example the Department of Industry and Investment's *Derelict Mines Program*).

I am the owner of a site that appears on the list. What should I do?

First of all, you should ensure the current use of the site is compatible with the site contamination. Secondly, if the site is the subject of EPA regulation, make sure you comply with the regulatory requirements, and you have considered your obligations to notify other parties who may be affected.

If you have any concerns, contact us and we may be able to offer you general advice, or direct you to accredited professionals who can assist with specific issues.

I am a prospective buyer of a site that appears on the list. What should I do?

You should seek advice from the vendor to put the contamination issue into perspective. You may need to seek independent expert advice.

The information provided in the list is meant to be indicative only, and a starting point for your own assessment. Site contamination as a legacy of past site uses is not uncommon,

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

particularly in an urbanised environment. If the contamination on a site is properly remediated or managed, it may not materially impact upon the intended future use of the site. However, each site needs to be considered in context.

List of NSW Contaminated Sites Notified to the EPA

Disclaimer

The EPA has taken all reasonable care to ensure that the information in the list of contaminated sites notified to the EPA (the list) is complete and correct. The EPA does not, however, warrant or represent that the list is free from errors or omissions or that it is exhaustive.

The EPA may, without notice, change any or all of the information in the list at any time.

You should obtain independent advice before you make any decision based on the information in the list.

The list is made available on the understanding that the EPA, its servants and agents, to the extent permitted by law, accept no responsibility for any damage, cost, loss or expense incurred by you as a result of:

1. any information in the list; or
2. any error, omission or misrepresentation in the list; or
3. any malfunction or failure to function of the list;
4. without limiting (2) or (3) above, any delay, failure or error in recording, displaying or updating information.

Site Status	Explanation
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or *Protection of the Environment Operations Act 1997*. Alternatively, the EPA may require information via a notice issued under s77 of the *Contaminated Land Management Act 1997* or issue a Preliminary Investigation Order.
Regulation under CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the *Contaminated Land Management Act 1997* is not required.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997*. A regulatory approach is being finalised.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the *Protection of the Environment Operations Act 1997* (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the *Environmental Planning and Assessment Act 1979* (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the *Contaminated Land Management Act 1997* (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the *Protection of the Environment Operations Act 1997* (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the *Environmental Planning and Assessment Act 1979* (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the *Contaminated Land Management Act 1997* (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Suburb	Site Name	Site Address	Contamination Activity Type	EPA Management Class	Latitude	Longitude
PAMBULA	Offsite area (roadways) adjacent to United Service Station	Corner Quondola Street and Bullara STREET	Service Station	Regulation under CLM Act not required	-36.93104481	149.8746763
PARKES	BP Reliance East End Service Station Parkes	46 Clarinda STREET	Service Station	Regulation under CLM Act not required	-33.14243539	148.1846227
PARKES	BP Truckstop	(Newell Highway) 1 Forbes ROAD	Other Petroleum	Regulation under CLM Act not required	-33.14309226	148.1710282
PARKES	Caltex Service Station Parkes	352-360 Clarinda STREET	Service Station	Regulation under CLM Act not required	-33.13317454	148.173643
PARKES	Former BP Telescope Service Station	339-341 Clarinda STREET	Service Station	Regulation under CLM Act not required	-33.13216152	148.1743239
PARKES	Former Caltex Parkes (Mugincoble) Depot - Eugowra	Eugowra ROAD	Service Station	Regulation under CLM Act not required	-33.19007031	148.224822
PARKLEA	Caltex Parklea Service Station	Old Windsor (north of Miami Street) ROAD	Service Station	Regulation under CLM Act not required	-33.72427108	150.9388531
PARRAMATTA	7-Eleven (former Mobil) Service Station	81 Victoria ROAD	Service Station	Regulation under CLM Act not required	-33.80919769	151.0142894
PARRAMATTA	BP Service Station	435 Church STREET	Service Station	Regulation under CLM Act not required	-33.80498714	151.0056151
PARRAMATTA	Coleman Oval Embankment	Cnr of Pitt STREET and Maquarie STREET	Unclassified	Regulation under CLM Act not required	-33.80441625	150.9954841
PARRAMATTA	Parramatta Park Toilet Block Demolition	The Cresent Toilet Block Parramatta PARK	Unclassified	Regulation under CLM Act not required	-33.81054034	150.9961968
PAUPONG	Former Timber Treatment Plant	Off Paupong ROAD	Other Industry	Regulation under CLM Act not required	-36.57657408	148.6624998
PENDLE HILL	7-Eleven Service Station	217 Wentworth AVENUE	Service Station	Regulation under CLM Act not required	-33.8017814	150.9577994
PENNANT HILLS	Shell Coles Express Pennant Hills West	386 Pennant Hills ROAD	Service Station	Contamination currently regulated under CLM Act	-33.73936462	151.0680237
PENRITH	7-Eleven (former Mobil) Service Station	212-222 Andrews ROAD	Service Station	Regulation under CLM Act not required	-33.73059678	150.6952571
PENRITH	7-Eleven Service Station Penrith	30 Henry STREET	Service Station	Regulation under CLM Act not required	-33.75408799	150.7045594
PENRITH	BP Express Service Station	Corner Coreen Avenue and Castlereagh ROAD	Service Station	Regulation under CLM Act not required	-33.74385498	150.6925743
PENRITH	Caltex Penrith Service Station	153 Coreen AVENUE	Service Station	Regulation under CLM Act not required	-33.74287244	150.6927071
PENRITH	Caltex Service Station	Castlereagh Rd Cnr Lugard STREET	Service Station	Regulation under CLM Act not required	-33.73426843	150.6933382
PENRITH	Crane Enfield Metals	Castlereagh ROAD	Metal Industry	Contamination currently regulated under CLM Act	-33.73734959	150.696442
PENRITH	Jet 60 Dry Cleaners	Shop 3 134-138 Henry STREET	Unclassified	Under assessment	-33.75231953	150.6964541
PENRITH	Lowes Petroleum (Former Mobil) Depot Penrith	174 Coreen AVENUE	Other Petroleum	Regulation under CLM Act not required	-33.74484268	150.6980504
PENRITH	Mirvac Industrial Site	2101 Castlereagh ROAD	Other Industry	Regulation under CLM Act not required	-33.73497514	150.6954097
PENSHURST	7-Eleven Service Station	612 Forest ROAD	Service Station	Regulation under CLM Act not required	-33.96153533	151.0793525
PENSHURST	Caltex Service Station	641 King Georges ROAD	Service Station	Regulation under CLM Act not required	-33.95985335	151.0891118

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Suburb - PENRITH

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Export to excel 1 of 4 Pages Search Again

Number	Name	Location	Type	Status	Issued date
6357	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	POEO licence	Issued	07 Jun 2000
1007008	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	05 Jul 2002
1020003	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	09 Sep 2002
1072516	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	20 Aug 2007
1085783	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	21 Oct 2008
1104746	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	06 Aug 2009
1109805	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26 Feb 2010
1512576	ACI OPERATIONS PTY. LTD.	130-172 ANDREW ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	12 Aug 2014
247	BORAL RESOURCES (NSW) PTY LTD	PEACHTREE ROAD, PENRITH, NSW 2750	POEO licence	No longer in force	22 Aug 2000
12405	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	09 Mar 2006
1070974	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	30 Jul 2007
1077652	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	31 Aug 2007
1109988	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19 Apr 2010
1525967	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	31 Oct 2014
1526072	CAPRAL LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	11 Nov 2014
1098	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	26 Jun 2000
1017498	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	24 Nov 2003
1072470	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	20 Sep 2007
1104995	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	04 Nov 2009
1512789	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	Compliance Audit	Complete	13 Mar 2013

1234

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Suburb - PENRITH

returned 77 results

Export to excel 2 of 4 Pages Search Again

Number	Name	Location	Type	Status	Issued date
1512775	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19 Mar 2013
1515690	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26 Jul 2013
1525217	CRANE ENFIELD METALS PTY. LIMITED	2115 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26 Sep 2014
10945	CUMMINS SOUTH PACIFIC PTY. LTD.	7 Andrews Road, PENRITH, NSW 2750	POEO licence	Surrendered	19 Jun 2000
1035208	CUMMINS SOUTH PACIFIC PTY. LTD.	7 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	08 Mar 2004
308	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	17 Jan 2000
1024084	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	06 Jan 2003
1044228	DORF CLARK INDUSTRIES LIMITED	2101 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	08 Feb 2005
11290	ENDEAVOUR ENERGY	96-120 Blaikie Road, PENRITH, NSW 2750	POEO licence	No longer in force	08 Jan 2001
1035197	ENDEAVOUR ENERGY	96-120 Blaikie Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	08 Mar 2004
1526441	Glass Recovery Services Pty Ltd	126 Andrews Road, PENRITH, NSW 2740	s.91 Clean Up Notice	Issued	27 Jan 2015
1535765	Glass Recovery Services Pty Ltd	126 Andrews Road, PENRITH, NSW 2740	s.91 Clean Up Notice	Issued	23 Aug 2016
3085780565	Glass Recovery Services Pty Ltd	126 Andrews Road, PENRITH, NSW 2740	Penalty Notice	Issued	28 Oct 2016
20381	Glass Recovery Services Pty Ltd	126 Andrews Road, PENRITH, NSW 2740	POEO licence	Issued	07 Nov 2017
12132	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750	POEO licence	Surrendered	01 Oct 2004
1097227	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750	s.58 Licence Variation	Issued	02 Feb 2009
1104874	GULF WESTERN PREMIUM QUALITY LUBRICATING OILS (MANUFACTURING) PTY LIMITED	1 COOMBES DRIVE, PENRITH, NSW 2750	s.58 Licence Variation	Issued	17 Aug 2009
6472	JAMES KEITH COSGROVE	8 HOYLE PLACE, PENRITH, NSW 2750	POEO licence	Surrendered	21 Jun 2000
1044521	JAMES KEITH COSGROVE	8 HOYLE PLACE, PENRITH, NSW 2750	s.58 Licence Variation	Issued	16 Feb 2005
7019	JAMISON PRIVATE HOSPITAL PROPERTY PTY LTD	366 JAMISON ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	20 Mar 2001

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Version: 1, Version Date: 14/04/2021

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Suburb - PENRITH

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Export to excel 3 of 4 Pages Search Again

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2869	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	05 Jun 2000
1012903	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	18 Feb 2002
1525246	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	02 Oct 2014
1556498	LD&D MILK PTY LTD	2257 - 2265 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.96 Prevention Notice	Issued	08 Sep 2017
3741	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	31 Jan 2001
1007235	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	10 May 2001
1008444	NAREX AUSTRALIA PTY LTD	LOT D FROGMORE ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	20 Aug 2001
2818	PANASONIC AVC NETWORKS AUSTRALIA PTY LTD	164 STATION STREET, PENRITH, NSW 2750	POEO licence	Surrendered	24 Mar 2000
1048338	PANASONIC AVC NETWORKS AUSTRALIA PTY LTD	164 STATION STREET, PENRITH, NSW 2750	s.58 Licence Variation	Issued	31 May 2005
10349	SYDNEY OLYMPIC PARK AUTHORITY	CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	06 Jan 2000
1409	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	25 May 2000
1005313	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	22 Oct 2001
1017898	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	26 Jun 2002
1018895	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	23 Dec 2002
1028330	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	08 Jul 2003
1032690	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	25 Nov 2003
1032982	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19 Mar 2004
1047700	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	30 Jun 2005
1061410	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	29 Jun 2006
1074754	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	27 Jun 2007

1234

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Version: 1, Version Date: 14/04/2021

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Suburb - PENRITH

returned 77 results

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4 of 4 Pages

Search Again

Number	Name	Location	Type	Status	Issued date
1116048	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	02 Jul 2010
1129012	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	27 Jun 2011
1504851	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	28 Jun 2012
1528922	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	23 Mar 2015
1538189	SYDNEY WATER CORPORATION	CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	19 Feb 2016
11461	TOTAL CONCRETE SOLUTIONS PTY LIMITED	261 COOMBES DRIVE, PENRITH, NSW 2750	POEO licence	No longer in force	19 Oct 2001
1294	VICARY CORPORATION PTY LIMITED	60-62 REGENTVILLE ROAD, PENRITH, NSW 2750	POEO licence	Surrendered	22 Aug 2000
12106	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	POEO licence	Surrendered	28 Apr 2004
1042219	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	10 Nov 2004
1065654	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	25 Oct 2006
1093267	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	10 Nov 2008
1127751	VIP STEEL PACKAGING PTY LTD	182-184 Andrews Road, PENRITH, NSW 2750	s.58 Licence Variation	Issued	03 Jun 2011
5269	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	POEO licence	Issued	10 Aug 2000
1066270	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	15 Dec 2006
1072508	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	23 Jul 2007
1100623	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	07 Oct 2009
1526064	VIRBAC (AUSTRALIA) PTY LTD	2152 CASTLEREAGH ROAD, PENRITH, NSW 2750	s.58 Licence Variation	Issued	11 Nov 2014

1234

12 February 2018

For business and industry () ^

For local government () ^

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix C Borehole Logs and Monitoring Well Installation Details

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix D Materials Tracking

Material Classification Form (example)

MCF Reference # 1000_____

Completed by	Nathan Cussen
Date	24 July 2015
Material Identification (Stockpile name and grid reference, importation source name and unique identification name etc.)	Type A Soils - Organic Garden Mix from Benedict Industries
Source location (Stockpile name and grid reference, source location and grid reference, off-site source address and description of source site residential, quarry etc.)	On site □ Details: Off site (Source Site) ☒ Details: Stockpile located at Menangle Quarry Benedict Industries, Menangle Road, Menangle, NSW.
JBS&G material classification report reference	JBS&G 1000 Date: 24 July 2015
Summary of material characterisation report as prepared by JBS&G	VENM □ for importation ENM □ Reuse on Site □ Waste Classification □ Other ☒ please describe VENM silty sand blended with recovered fines topsoil, ash, fowl manure and composted organics to be imported to site
Volume of material	Survey Information □ Field Estimate □ Required Quantity (off-site source) ☒ Approximately 65 m^3
Material description (material type, colour, inclusions, etc.)	Type A Organic Garden Mix – brown VENM alluvial silty sand and topsoil blended with recovered fines topsoil, ash, fowl manure and compost organics
Is the material free of ACM, staining and malodourous soils	Yes ☒ No □ Details:
If assessment is of material from an off-site Source, is the material suitable for importation to the site?	Yes, the material is suitable to be imported to site.
If assessment is for off-site disposal of material, what is the final waste classification / reuse exemption conclusion?	N/A
If the assessment is for reuse of the material at the site, is the material suitable for reuse	Suitable for reuse: - below the capping profile in road corridor □ - above the capping profile in road corridor footprint and used in landscaped areas ☒ - below the capping profile in recreational areas □ - above the capping profile in recreational areas and used in landscaped areas ☒ - below the marker layer in Lots 8 and 9 □ - above the marker layer in Lots 8 and 9 and used within landscaped areas ☒ - below the marker layer in Lot 12 □ - above the marker layer in Lot 12 and used within landscaped areas ☒
Other comments:	Please ensure Benedict dockets are retained, the volume imported documented and all materials tracked in accordance with the materials tracking plan.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Material Tracking Sheet Part A (example)

MTS Reference #_____

Materials Tracking Form Part A (Materials Received, Excavated, Stored or Placed)										
Completed by:										
Date:										
Comment (Are there any visual or olfactory indicators of contamination):										
Load No.	**Time**	**Truck Rego / Plant ID**	**Load Quantity (m^3)**	**MCF Reference No**	**Source Location and ID**	**Temporary Stockpiled Y/N and New ID**	**Final Placement Location Y/N**	**Placement location**	**Reduced level of placement m AHD (final placement only)**	**GPS Coordinates (final placement only)**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Material Tracking Sheet Part B (exam

MTS Reference #_____

Part B Off-site Disposal							
Completed by:							
Date:							
Receiving Site:							
Hauling subcontractor:							
Load No.	Time	Truck Rego / Plant ID	Load Quantity (m^3)	Material Classified as waste Y/N	Waste Description and JBS&G Reference No. including any visual or olfactory indicators of contamination	Source location	Receipt/Consignment No.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Document Status

Rev No.	Author	Reviewer	Approved for Issue		
		Name	Name	Signature	Date
A	Rohan Hammond	Greg Dasey	For Review	For Review	30 January 2019
0	Rohan Hammond	Greg Dasey	Greg Dasey		5 March 2019

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Version: 1, Version Date: 14/04/2021

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20030 IA01 9April20.docx

9 April 2020

Wasique Mohyuddin
Penrith City Council
PO Box 60
Penrith NSW 2751

Via email: Wasique.Mohyuddin@penrith.city
cc: CBielby@jbsg.com.au

Dear Wasique,

Re: Interim Advice 1 (IA1) – Review of Draft Sampling, Analysis and Quality Plan (SAQP), Penrith City Park, NSW

1 Introduction

Penrith City Council (Council) has appointed Rebeka Hall of Zoic Environmental Pty Ltd (Zoic), a NSW EPA Auditor accredited (No. 0802) under the Contaminated Land Management (CLM) Act 1997, to conduct an Audit for the proposed Penrith City Park located at the corner of Henry and Station Streets, Penrith NSW ("the site"). The future park 'site' is legally identified as:

- Lot 1 in DP254763 – Henry Street (to be west of Lot 1 in DP113118)
- Lot 1 in DP164798 and Lot 1 in DP252457 – 134-138 Henry Street
- Lot 10 and 11 in DP553665 – 142 Henry Street
- Lot 2 in DP 556075 – 144 Henry Street
- Lot 3 in DP1200790 – 42 to 44 Station Street
- Lot 1 in DP 526304 – 48 to 50 Station Street
- Lot E DP 163176 – 46 Station Street
- Western portion of Allen Place Car Park, Gaymark Lane and Allen Place (no lot and DP available)

The site occupies an area of approximately 7,500m^2 and is currently used as commercial, retail and car parking area.

The proposed development will comprise a large open recreational space, consisting a mixture of paved and grassed areas including shallow/deep planted gardens and potentially raised garden boxes.

The aim of the engagement is to enable a site audit statement (SAS) and associated site audit report (SAR) to be prepared that confirms the suitability of the site for proposed redevelopment

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

as open recreational space at the completion of remedial works. This audit is being conducted in accordance with the requirements outlined in the NSW EPA (2017) Contaminated Land Management Guidelines for the NSW Site Auditor Scheme (3rd edition).

2 Scope of Audit and Nature of Interim Advice

NSW EPA (2017) describes the site assessment and audit process as:

1. *Consultant is commissioned to assess contamination*. The contaminated site consultant designs and undertakes the site assessment and, where required, all remediation and validation activities to achieve the objectives specified by the owner or developer; and
2. *Site auditor reviews the consultant's work*. The site owner or developer commissions the Auditor to review the consultant's work. The Auditor then prepares a SAR and SAS at the conclusion of the review, which are given to the owner or developer.

Therefore, the contaminated land consultant and other relevant parties should be satisfied that the work to be conducted conforms to all appropriate regulations, standards and guidelines and is suitable based on the site history and the proposed land use.

It is understood that the Audit is currently non statutory in nature. Once development approval is issued by Council, the Audit will become statutory in nature and require notification to NSW EPA.

3 Current Interim Advice

In preparing this interim audit advice, the Auditor has reviewed the following related to further land contamination assessment required at the site:

- JBS&G Australia Pty Ltd (JBS&G, 23 March 2020) Pre-Remediation Investigation, Sampling Analysis and Quality Plan, Penrith Central Park Village, Ref: 58140/127353 Rev A, referred to as the JBS&G (23 March 2020) Draft SAQP.

The purpose of the current IA is to document Auditor findings following the review of the scope of work proposed as part of the pre-remediation assessment.

The SAQP has been prepared for the pre-remediation assessment of soils underlying 134-138 and 140 Henry Street, which was denoted as Area of Environmental Concern (AEC) AEC1 in the Auditor endorsed Remediation Action Plan (RAP)[1]. AEC1 was located within the former dry cleaning operation. The other 3 AECs identified in the RAP will not be assessed as part of the current pre-remediation assessment.

The 'investigation area' for the pre-remediation assessment is limited to the properties at 124-138 and 140 Henry Street (AEC 1).

[1] In September 2017, Zoic was commissioned by Council to complete a Section B Site Audit (Zoic Ref: 19124) for the Central City Park development (for both the Future Park (western portion) and Developable Area (eastern portion)). At the end of the site audit, a Site Audit Statement (SAS) was issued, certifying that, in the opinion of the Auditor that the site can be made suitable for the proposed development if the site is remediated in accordance with the JBS&G (5 March 2019) Penrith Central Park Village Overarching Remedial Action Plan 114 to 146 Henry Street, 42 to 50 Station Street, and Allen Place Car Park (Ref: 55073/120362 Rev 0) subject to compliance with conditions as stated in the Site Audit Statement.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4 Summary of Proposed Pre-remediation Assessment

The objective of the pre-remediation assessment is to inform the remedial extent within the investigation area (denoted as AEC 1 in the RAP and SAQP). The remedial works aims to render the site suitable including no impact to future offsite receptors in basements/buildings to the east (not part of this current development stage, but within the greater Penrith Central Park Village) and the removal of ongoing source of contamination to groundwater.

The scope of investigation will include the following:

- Installation of 18 sub-slab soil vapour probes across AEC1 and the existing sewer pipe network beneath the site.
- Installation of 5 soil vapour probes to depths of either 1m or 4m at each location. Location of the deep soil vapour problems will be informed by sub-slab vapour results and will depend on site access. JBS&G indicates that vapour probes are likely to be installed within areas of greatest chlorinated ethene (CE) impact and towards the eastern boundary of the site, adjacent to the proposed future basement development.
- As part of the drilling works, soil cutting will also be screened with a field gas GC-PID instrument. Results from the GC-PID measurements will be compared to carbon tube duplicate samples submitted to a NATA accredited laboratory for VOC 8260 analysis.
- Soil vapour sampling will be conducted at least 24hrs after installation using the carbon tube method.
- All samples collected from sub-slab and soil vapour probes will be analysed for VOC8260.
- Soil samples will also be collected during the drilling of deep soil vapour probes for preliminary waste classification. Soil samples will be analysed for BTEX, TPH, PAH, OCP, PCB, VOC, heavy metals, asbestos and TCLP (metals and PAH).

5 Auditor Evaluation of SAQP

The sampling and analysis plan and associated methodologies proposed have been evaluated by the Auditor with comments provided in Table 1 for Soil Assessment and Table 2 for Soil Vapour Assessment.

Table 1: Sampling and Analysis Plan for Soil

Sampling Item	EPA Guidelines	JBS&G (30 March 2020) SAQP	Auditor Comments
Data Quality Objectives (DQOs) (soil vapour and soil assessments)	"Data Quality Objectives: Outline of the DQO Process" in Schedule B2 of NEPM (2013).	The 7 step DQOs for **investigation**, as summarised in Section 7, are as follows: • Step 1: Remedial works are required for principally chlorinated ethene impact for the site. The works is required to assess data gap such that the remedial works plan (RWP) can be prepared for the development area. • Step 2: Decisions are: has the impact/s been delineated?; preliminary waste class; impacts of chemical mixtures; and further	The Auditor considers the DQOs for **investigation** works to be appropriate

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Sampling Item	EPA Guidelines	JBS&G (30 March 2020) SAQP	Auditor Comments
		assessment requirement (if needed). • Step 3: Inputs are previous data, lab data, site criteria and QA/QC. • Step 4: Boundaries are AEC1; 0.5m into natural; 4mbgs. • Step 5: Decision rules are meeting NEPM (2013) criteria; delineation achieved?; waste classification; impacts of chemical mixtures and, further assessment required? • Step 6: Decision error limits based on AS4482.1-1995 for number of samples to make a decision. • Step 7: Design for optimising data collection by sampling as per SAQP.	
Sampling Pattern Rationale:	The EPA (1995) Sampling Design Guidelines (Section 2.3) provides details on judgmental, random, systematic and stratified sampling pattern.	Section 7.3 states that soil samples will be collected from deep soil vapour probes, of which final locations will be dependent on outcome of soil vapour assessment.	Given the purpose of soil assessment work is to inform preliminary waste classification, it is considered acceptable, noting that additional sampling will be conducted prior to actual waste disposal during remedial/construction works.
Sampling Density Rationale:	EPA (1995) Sampling Design Guidelines	No information provided. Section 7.3 states that soil samples will be collected from deep soil vapour probes, of which final locations will be dependent on outcome of soil vapour assessment.	Given the purpose of soil assessment work is to inform preliminary waste classification, it is considered acceptable.
Locations Shown on Site Plan:	The OEH (2011) Guidelines for Consultants reporting on Contaminated Sites requires that sampling locations are shown on a site plan.	The locations are shown on Figures in Appendix A. JBS&G notes that deep soil vapour probes / soil sampling locations will be installed after assessment of sub-slab soil vapour result therefore locations are not shown on figures in Appendix A.	The Auditor considers this requirement to have been met.
Sampling Depths	The OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites requires information on the depths of samples that were collected. NEPM (2013) Schedule B2.	Section 7.3 states that 'soil samples will be collected directly underneath the hardstand (concrete) then generally at 0.5-1.0 m intervals to a maximum depth of 4 m'.	The Auditor considers the sampling depths to be appropriate.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Sampling Item	EPA Guidelines	JBS&G (30 March 2020) SAQP	Auditor Comments
Selection of Samples for Analysis:	The OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites. NEPM (2013) Schedule B2	Table 7.3 states that 5 samples will be selected for soil analysis.	The Auditor considers the selection of samples for analysis to be appropriate.
Sample Splitting Techniques and Statement of QA/QC Sample Frequencies	NEPM (2013) Schedule B3 EPA (2017) Guidelines for the NSW Site Auditor Scheme OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites	Section 7.3 states that 'duplicate soil samples will be collected at a rate of one per 20 primary samples. Duplicate samples will be collected for QA/QC purposes from the push tube by taking discrete soil samples and placing directly into the sample jars. Samples will not be mixed prior to placement into the jars to minimise the potential for loss of volatiles. Similarly, where 500 mL samples will be required for duplicate asbestos analysis - no mixing of material will be undertaken prior to placement into plastic bags to prevent the loss of free fibres'.	The Auditor considers that the sample splitting techniques were appropriate. The QA/QC sampling frequencies for the investigations generally comply with NEPM (2013) requirements. The Auditor considers this to be acceptable.
Analytical Methods:	EPA (2017) Guidelines for the NSW Site Auditor Scheme	Section 7.4 states that 'JBS&G will contract Eurofins/mgt (Eurofins) as the primary laboratory, with Envirolab Services (Envirolab) as the secondary laboratory. Both laboratories are NATA registered for the required analyses'.	The Auditor considers the analytical methods to be appropriate.
Sample Container Selection:	NEPM (2013) Schedule B2 and B3	Section 7.3 states that 'collected samples will be immediately transferred to laboratory supplied sample jars (additional 500 mL plastic bags will be used where asbestos analysis is required)'.	The Auditor considers the sample container selection to be appropriate.
Sampling Devices / Techniques	NEPM (2013) Schedule B2 and B3 DEC (2007) Groundwater Guidelines	Section 7.3 states that 'soil samples will be collected via push tube or solid flight auger (to be only used if required for the collection of soil samples at depth) sampling using a Geoprobe track mounted drilling rig at the nominated borehole locations for the installation of deep soil vapour probes'.	The Auditor considers the sampling devices / techniques adopted to be appropriate.
Decontamination Procedures:	Australian Standard AS4482.1 – 2005 NEPM (2013) Schedule B2 and B3	Section 7.3 states that 'all non-disposable sampling equipment, including augers, will be cleaned with a high pressure water/ detergent	The Auditor considers the decontamination procedures to be appropriate.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Sampling Item	EPA Guidelines	JBS&G (30 March 2020) SAQP	Auditor Comments
		spray, rinsed with water and then air dried. The equipment was then inspected to ensure that no soil, oil, debris or other contaminants were apparent on the equipment prior to the commencement of works. Sampling equipment was subsequently decontaminated using the above process between each location'.	
Sample Handling and Preservation Procedures:	NEPM (2013) Schedule B3 AS4482.1 and AS 4482.2	Section 7.3 states that 'the sample jars/bags will then transferred to a chilled ice box for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form will be completed and forwarded with the samples to the testing laboratory'.	The Auditor considers these procedures to be appropriate.
Field Calibration and Screening Protocols	NEPM (2013) B2	Section 7.3 states that 'soil samples will be screened on site during works using a PID and GC-PID to assess the presence of VOCs including TCE and PCE'.	The Auditor considers the field calibration and screening protocols to be appropriate.
Groundwater Monitoring Well Installation	NEPM (2013) Schedule B2 DEC (2007)	Not proposed	Not applicable
Groundwater Monitoring Well Development & Sampling	NEPM (2013) Schedule B2 DEC (2007)	Not proposed	Not applicable

Table 2. SAQP for Soil Vapour Sampling

Requirement	Guideline	JBS&G (30 March 2020) SAQP	Auditor Comment
Location and number of sampling points	Section 9.4.1 NEPM B2 (2013)	JBS&G proposes 18 sub-slab soil vapour pins to be installed across AEC1 and the vicinity of existing sewer line where soil vapour impacts were previously identified. The pins will be installed on a 12m by 8m grid. Following review of the sub-slab soil vapour samples, an additional 5 deep soil vapour probes will be installed. JBS&G states that 'the location of the deep soil vapour probes will be informed by the results of the sub-slab vapour assessment and on site access. Noting that the sample locations will be required to inform the depth of	**The proposed grid is less than the density proposed in JBS&G (5 March 2020) Overarching RAP where a 5m grid was nominated.** **The proposed sampling points along the sewer line appear to be approx. 10m apart from each other.** **Please justify.**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Requirement	Guideline	JBS&G (30 March 2020) SAQP	Auditor Comment
		excavation required to be protective of future off-site receptors in potential basements/buildings to the east (within the PCPV development), it is likely that the probes will be installed within areas of greatest identified CE impact (in sub-slab vapour) and towards the eastern boundary of the subject site'.	
Depth of sampling point	Section 9.4.1 NEPM B2 (2013)	Section 7.2.1 states that the sub-slab vapour probe will be installed to approx. 0.15mbgs, which is the anticipated thickness of concrete slab. Section 7.2.1 states that the soil vapour probe will be installed to 1m or 4m deep at each location.	Acceptable for sub-slab vapour pin. **Please clarify the proposed depth of soil vapour probe. Does JBS&G mean 1 to 4m?**
Frequency of sampling	Section 9.4.1 NEPM B2 (2013) CRC Care Technical Report 13 (2009)	No information provided.	**Please confirm the number of sampling rounds? Climatic conditions to be considered.**
Sampling installation method	Section 9.4.2.2 NEPM B2 (2013)	Sub-slab vapour pins will be installed as follows: • Record location of probe using GPS; • Drill a 16 mm diameter hole through the concrete slab which is anticipated to be approximately 150 mm thick; • Installation of a VaporPin metallic probe following the manufacturer's instructions, which briefly comprises hammering the probe with silicone sleeve into the drilled hole to a depth of the encountered slab thickness; and • Undertake a leak test Soil vapour probes will installed as follows: • Installation of soil vapour probe by use of teflon tubing, consisting of placement of 2mm graded sand adjoining the base of the sample tube, placement of a nominal thickness of bentonite chips overlying the graded sand, completion of borehole by filling with grout / bentonite chips to the site surface	The Auditor considers the sampling installation method to be appropriate.
Equilibration period	Section 9.4.2.2 & 9.4.2.4 NEPM B2 (2013)	Section 7.2.3 states that 'soil vapour probes will be left to equilibrate for a period of at least 24 hours before sampling.	Acceptable
Sampling method	Section 9.5.1 & 9.5.2 NEPM B2 (2013)	Active sampling using carbon tubes at a constant flow rate.	Acceptable
Probe integrity / seal	Section 9.4.2.4 NEPM B2 (2013)	Section 7.2.3 states that 'leak detection evaluation will be completed via placement of an isopropyl alcohol	Acceptable

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Requirement	Guideline	JBS&G (30 March 2020) SAQP	Auditor Comment
		soaked rag within an air tight box containing the sample train over the top of the backfilled borehole, to assess the potential occurrence of leaks whilst the gas detector is used to purge the sample point. Elevated PID readings on the gas detector will be assumed to indicate a leaking probe. Any leaking probes will be required to be re-installed and rechecked prior to sampling using the same method'.	
Tubing type	Section 9.4.2.4 NEPM B2 (2013)	Teflon tubing	Acceptable
Sample flow rate 0.1-100L/min	Section 9.4.2.4 NEPM B2 (2013)	210mL/min using a calibrated pump	Acceptable
Sample volume and duration	Section 9.4.2.4 NEPM B2 (2013)	6.3L at a rate of 210mL/min which equates to 30min sample time.	Acceptable
Purge method and biodegradation monitoring	CRC Care Technical Report 13 (2009)	Section 7.2.3 states that 'an MX6 gas detector will then be used to purge each probe for a period of approximately 30 seconds. Gas readings will be monitored until oxygen and photo-ionisation detector (PID) readings stabilise'.	Acceptable
Sample splitting	Section 19.10 NEPM B2 (2013)	No information provided.	**Please provide**
Duplicate frequency	Section 19.10 NEPM B2 (2013)	No information provided.	**Duplicate samples should be collected at a rate of 1 per 20 primary samples as per NEPM 2013.**
Analytical methods	Section 19.10 NEPM B2 (2013)	VOC 8260	The Auditor considers this analytical method to be appropriate

6 Auditor Comments

The Auditor has reviewed the JBS&G (23 March 2020) Draft SAQP against relevant guidelines made or approved by NSW EPA. The report largely meets the guideline requirements, however, the Auditor provides the following **comments to be addressed by JBS&G in finalising the SAQP and completing the proposed pre-remediation investigation works**:

1. General comment: No site assessment criteria is provided for review.
2. General comment: Please confirm and justify the proposed number of soil vapour sampling.
3. General comment (soil vapour QA/QC program): No information is provided for soil vapour duplicate sampling procedures. Field QA/QC sampling should be conducted in accordance with NEPM 2013.
4. General comment: Additional deep soil vapour probes should be considered if sub-slab results show high concentrations across AEC1.
5. Section 7.2 (sub-slab / soil vapour assessment): The proposed sampling density is on a 12m by 8m grid, which is less than the density nominated in the endorsed JBS&G (5 March 2019) Overarching RAP (5m grid). The sampling points along the sewer pipe is approx. 10m apart from each other. Please justify the deviation in approach.
6. Section 7.2.2 (soil vapour probe installation): It is noted that soil vapour probe will be installed to either 1m or 4m deep. Does JBS&G mean 1m to 4m deep? Please clarify.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7. Table 7.3: Please clarify why 4 samples are to be selected for asbestos analysis.
8. Section 7.5 (data assessment): Assessment report is to be forwarded to the Auditor for review and endorsement prior to preparation of RWP.

This interim advice does not constitute a SAS or a SAR, but rather is provided to assist the Client in the assessment and management of contamination issues at the site. The information provided herein should not be considered pre-emptive of the final Audit conclusions. It represents the Auditor's opinion based on the review of currently available information.

Should you have any queries or wish to discuss any points, please do not hesitate to contact Fiona Wong or the undersigned.

Yours sincerely,

Rebeka Hall
NSW EPA Accredited Site Auditor
Zoic Environmental Pty Ltd

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G 58140-129,180
L01 (Responses to IA1 - Penrith City Park) Rev A

1 May 2020

Rebeka Hall
Site Auditor
Zoic Environmental Pty Ltd
Via email: rebeka.hall@zoic.com.au

CC: Wasique Mohyuddin
Major Projects Coorinator
Penrith City Council
Via email: wasique.mohyuddin@penrith.city

Summary of Responses to Interim Advices No. 01
Penrith Central Park Village

Dear Rebeka,

JBS&G Australia Pty Ltd (JBS&G) has been engaged by Penrith City Council (Penrith, the client) to provide environmental consultancy services associated with the proposed redevelopment of the Penrith City Village Park (PCPV). JBS&G has recently been in receipt of:

- Interim Advice 1 (IA1) – Review of Draft Sampling and Analysis Plan, Penrith City park, NSW, 9 April 2020, Zoic Environmental Pty Ltd (Zoic 2020).

Responses to each of the issues raised in the interim advice are detailed following. A revised copy of the Sampling, Quality and Analysis (SAQP JBSG 2020[1]) has been prepared consistent with the scope of the actions to address each of the comments in IA1.

IA1 – SAQP

1. *General comment: No site assessment criteria is provided for review.*

Section 7.5 has been updated to provide the assessment criteria intended to be applied to the assessment.

2. *General comment: Please confirm and justify the proposed number of soil vapour sampling.*

The proposed number of sampling locations is provided in Table 7.3. As noted, the proposed sampling density is less than that specified in the RAP (JBS&G 2019a) due to access restrictions in which certain areas/commercial spaces are currently tenanted. Where access can accommodate a sampling density of a 5 m grid (in accordance with the RAP), JBS&G will conduct the sampling in accordance with this density to refine the required remedial extent. However, should access be limited and the proposed sampling density (as per SAQP) is implemented – the remedial extent will still be defined (albeit to less resolution) and the broad objectives of the pre-remediation investigation will still be satisfied. Section 7.2 has been updated.

[1] *Sampling Analysis and Quality Plan for* Pre-Remediation Investigation, Penrith Central Park Village, 134 to 144 Henry Street, 42 to 50 Station Street and Allen Place Car Park, JBS&G Australia Pty Ltd, 28 April 2020 (JBS&G 2020).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3. *General comment: No information is provided for soil vapour duplicate sampling procedures. Field QA/QC Sampling should be conducted in accordance with the NEPM 2013.*

Blind and split duplicate samples will be collected sequentially, following the collection of the primary sample in accordance with the procedures described in Section 7.2.3. Blind and split duplicate samples will be collected at a rate of 1/20 primary samples. Section 7.2.3 has been updated.

4. *General comment: Additional deep soil vapour probes should be considered if sub-slab results show high concentrations across AEC1.*

Comment noted and agreed. The primary objective of the deep soil vapour probes is to assess the likely remedial excavation depth across AEC1. Should additional probes assist with refining the required remedial depths across AEC1 – JBS&G will complete the additional sampling where possible and subject to Council approval.

5. *Section 7.2 (sub-slab / soil vapour assessment): The proposed sampling density is on a 12 m by 8 m grid, which is less than the density nominated in the endorsed JBS&G (5 March 2019) Overarching RAP (5 m grid). The sampling points along the sewer pipe is approx. 10 m apart form each other. Please justify the deviation in approach*.

See response to Comment 2, in which the reduced sampling density is a result of constrained access. Where possible, JBS&G will complete the sampling density in accordance with the RAP (JBS&G 2019).

6. *Section 7.2.2 (soil vapour probe installation): It is noted that soil vapour probe will be installed to either 1 m or 4 m deep. Does JBS&G mean 1 m to 4 m deep? Please clarify.*

It is proposed to collect soil vapour samples from both 1 and 4 m depths within each 'deep soil vapour probe' location to inform likely remedial excavation depths. Section 7.2.3 has been updated to remove the ambiguous language.

7. *Table 7.3: Please clarify why 4 samples are to be selected for asbestos analysis.*

The proposed asbestos analysis is simply to inform preliminary waste classification of fill-based soils within the source area of AEC1.

8. Section 7.5 (data assessment): Assessment report is to be forwarded to the Auditor for review and endorsement prior to preparation of RWP.

Noted and agreed. Section 7.5 has been updated.

Should you require clarification, please contact the undersigned on 02 8245 0300 or by email cbielby@jbsg.com.au.

Yours sincerely:

Chris Bielby
Senior Environmental Consultant
JBS&G Australia Pty Ltd

Matthew Bennett, CEnvP SC
Senior Principal Contaminated Land
JBS&G Australia Pty Ltd

Attachments:
Limitations

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Attachment 1 – Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquiries.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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23 October 2020

Wasique Mohyuddin
Penrith City Council
PO Box 60
Penrith NSW 2751

Via email: Wasique.Mohyuddin@penrith.city
cc: CBielby@jbsg.com.au

Dear Wasique,

Re: Interim Advice 1 (IA3) – Review of Draft Pre-Remediation Investigation and Remedial Work Plan (RWP), Penrith City Park, NSW

1 Introduction

Penrith City Council (Council) has commissioned Rebeka Hall of Zoic Environmental Pty Ltd (Zoic), a NSW EPA Auditor accredited (No.0802) under the Contaminated Land Management (CLM) Act 1997, to conduct an Audit for the proposed Penrith City Park located at the corner of Henry and Station Streets, Penrith NSW ("the site"). The future park 'site' is legally identified as:

- Lot 1 in DP254763 – Henry Street (to be west of Lot 1 in DP113118)
- Lot 1 in DP164798 and Lot 1 in DP252457 – 134-138 Henry Street
- Lot 10 and 11 in DP553665 – 142 Henry Street
- Lot 2 in DP 556075 – 144 Henry Street
- Lot 3 in DP1200790 – 42 to 44 Station Street
- Lot 1 in DP 526304 – 48 to 50 Station Street
- Lot E DP 163176 – 46 Station Street
- Western portion of Allen Place Car Park, Gaymark Lane and Allen Place (no lot and DP available)

The site occupies an area of approximately 7,500m^2 and is currently used as commercial, retail and car parking area.

The proposed development will comprise a large open recreational space, consisting a mixture of paved and grassed areas including shallow/deep planted gardens and potentially raised garden boxes.

The aim of the engagement is to enable a site audit statement (SAS) and associated site audit report (SAR) to be prepared that confirms the suitability of the site for proposed redevelopment

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

as open recreational space at the completion of remedial works. This audit is being conducted in accordance with the requirements outlined in the NSW EPA (2017) Contaminated Land Management Guidelines for the NSW Site Auditor Scheme (3rd edition).

2 Current Interim Advice

The Auditor had previously issued IA1 (9 April 2020) and IA2 (11 May 2020) on the JBS&G Sampling Analysis and Quality Plan (SAQP). The JBS&G (1 May 2020) SAQP was prepared for the pre-remediation assessment of soil underlying 134-138 and 140 Henry Street, referred to as Area of Environmental Concern 1 (AEC1) as required by the Auditor endorsed Remediation Action Plan (RAP)[1]. The objective of the pre-remediation assessment was to inform the extent of remediation required for AEC1. AEC1 is the portion of the site impacted by contaminants associated with former dry-cleaning operations. The other 3 AECs (AEC2-former service station to the east; AEC3 soils under transformers; AEC4 unknown quality of fill material underlying buildings and pavement) identified in the RAP do not form part of the current pre-remediation assessment.

In preparing this interim audit advice, the Auditor has reviewed the following related to further assessment conducted for AEC1:

- JBS&G Australia Pty Ltd (JBS&G, 17 September 2020) Pre-Remediation Investigation, Penrith Central Park Village, Ref: 58140/131749 Rev A, referred to as the JBS&G (17 September 2020) Draft Pre-Remediation Investigation Report.
- JBS&G (17 September 2020) Remedial Work Plan (RWP), Penrith Central Park Village, Ref: 58140/132003 Rev A, referred to as the JBS&G (17 September 2020) Draft RWP.

The purpose of the current IA is to document Auditor findings following review of the interim results for pre-remediation investigation into soil vapour conditions and the proposed scope for the remedial works. The Auditor notes that, whilst a grid based soil vapour sampling within the source area of AEC1 was adopted, sampling only occurred in accessible areas and as such the extent of investigation did not achieve the density outlined in the SAQP (JBS&G, May 2020).

The JBS&G (18 September 2020) Draft RWP covers the following AECs as identified in the JBS&G (5 March 2019) Overarching Remedial Action Plan (Ref: 55073/120362 Rev 0), which was endorsed by the Auditor at the time of completion of the Section B Site Audit Statement (17124 SAS116, dated 18 April 2019): The RAP is referred to as the JBS&G (2019) Overarching RAP in this interim advice:

- AEC 1 – Chlorinated ethene impacted soil
- AEC 3 – Soils underlying transformer
- AEC 4 – Fill material underlying buildings and pavement

[1] In September 2017, Zoic was commissioned by Council to complete a Section B Site Audit (Zoic Ref: 19124) for the Central City Park development (for both the Future Park (western portion) and Developable Area (eastern portion)). At the end of the site audit, a Site Audit Statement (SAS) was issued, certifying that, in the opinion of the Auditor that the site can be made suitable for the proposed development if the site is remediated in accordance with the JBS&G (5 March 2019) Penrith Central Park Village Overarching Remedial Action Plan 114 to 146 Henry Street, 42 to 50 Station Street, and Allen Place Car Park (Ref: 55073/120362 Rev 0) subject to compliance with conditions as stated in the Site Audit Statement.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

It is noted that AEC 2 (former service station) is located outside of the proposed Penrith City Park development area.

In addition to the above documents, the following laboratory reports were also provided to the Auditor:

- Eurofins Draft Test Results – Report 722971
- Eurofins Test Results – Report 724112

These samples were collected from the stormwater system 'which runs along Gaymark Lane, crossing Henry Street and then going beside the tax office building'. It is understood that these samples were collected during the CCTV investigation of the existing drainage system, and that these results will be evaluated and reported by JBS&G at a later date as the investigation is ongoing. The Auditor has not conducted a review of the raw data.

3 Summary of Pre-remediation Assessment

The scope of investigation in AEC1 included the following:

- Installation of 16 sub-slab soil vapour pins (SS1 to SS9) across the northern portion of AEC, accessible area to the west of AEC 1 (SV12 to SV17) and within the proximity of the existing sewer pipe (SV18).
- Installation of 2 deep soil vapour probes (SV10 and SV11).
- All soil vapour samples collected from vapour pins and deep soil vapour probes were submitted to a NATA accredited laboratory for VOC 8260 analysis.
- Soil samples were collected during the installation of the 2 deep soil vapour probes to facilitate preliminary waste classification assessment. Selected samples were analysed for BTEX, PAH, TRH, OCP, PCB, VOC, heavy metals, asbestos (500mL), TCLP for PAH and ASLP for VOC.

4 Summary of Proposed Remedial Works

The proposed remedial works as outlined in the RWP includes:

- **Capping of asbestos impacted soils (AEC4)**, pending assessment of the type and extent of impact within the audit area. The preferred approach will require approval by the Auditor prior to implementation.
- **Chlorinated ethene impacted soils (AEC1)** will be remediated by:
  - Decommissioning of all underground utilities within the remediation area
  - Excavation and stockpiling of impacted soil within the remediation area. Excavated materials will be placed in 70m3 stockpiles which will then be assessed for suitability for onsite containment. Materials considered unsuitable for onsite containment will be disposed offsite.
  - The proposed containment cell will be located at least 30m lateral distance away from current and future offsite structures and located above the groundwater table (approx. 7mbgs).
- **Soils underlying transformers (AEC3)** will be subject to further assessment. The preferred remediation approach will require consideration and approval by the Auditor prior to implementation.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5 Review of JBS&G (18 September 2020) Draft Remedial Works Plan

The RWP prepared for the future Council park has been audited in accordance with the requirements outlined in EPA (2017) Contaminated Land Management Guidelines for the NSW Site Auditor Scheme (3rd edition), OEH (2011) Guidelines for Consultants Reporting on Contaminated Sites and with consideration of the amended NEPC (1999) National Environment Protection (Assessment of Site Contamination) Measure, Schedule A and Schedules B(1)-B(9) by National Environment Protection Council, Adelaide (April 2013).

A summary of the document review is presented in the following table.

Table 1: Summary of JBS&G (18 September 2020) Draft RWP

Requirement	Consultant Consideration	Auditor Comment
Objectives:	Section 1.2 states that the objectives of the remediation were to 'render the site suitable for the proposed use'. JBS&G further states that 'this RWP will be revised upon receipt of the additional investigation results proposed to be completed prior to remediation works as outlined in JBS&G (2020). '	Auditor notes: • Further data gap investigation to determine the extent of remedial works required for AEC 1 (chlorinated ethene impacted soils) is proposed • Fill material not accessible at the time of the JBS&G (2018) investigation, requires characterisation to determine whether it requires remediation **The draft RWP has only been prepared for AEC1, AEC3 and AEC4 on the basis that the 'extent' has not yet been fully determined.** **Delineation of groundwater impact and/or offsite migration is to be assessed as required by the Auditor as part of endorsing the Overarching RAP. There is a requirement for " delineation of the offsite extent of the groundwater contamination should be undertaken to ensure the extent of the groundwater contamination is known and can be managed during the future redevelopment of the land" as outlined in NSW EPA letter (4 July 2020) to Council.** **The RWP will be an evolving document as new information is obtained.**
Scope of work	Section 4 states that the scope includes: • Remediation of asbestos impacted soils, noting that further assessment will be required to determine the nature and extent of the remedial works • Remediation of chlorinated ethene impacted soils • Remediation and/or management of soils underlying transformer	Acceptable, noting further characteristion is required for AEC1, 3 and 4 as well as addressing groundwater.
Site identification	Section 2.1 provides site identification details.	Acceptable
Site history	Not provided.	Although not included in the RWP, this is outlined in the overarching RAP (JBSG 2019)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Requirement	Consultant Consideration	Auditor Comment
Site condition and surrounding environment	Not provided.	Although not included in the RWP, this is outlined in the overarching RAP (JBSG 2019)
Remediation criteria	Soil remediation criteria have not been included as onsite containment is the preferred option. For chlorinated ethene impacted soil, ASLP results will be compared to ANZG (2018) for freshwater ecosystems protective of 95% of species. An attenuation factor of 10 will be applied to the applicable criteria before screening of the validation data given that the containment cell will be placed above the groundwater table and that surface water infiltration will largely eliminated through a GCL membrane or hardstand surface Section 6.1.2 states that 'validation criteria for the excavation extent is to be agreed with the site auditor prior to implementation'.	**Please refer to Section 7 for Auditor comments.**
Results	Tabulated results and figures have not been included. Section 4 discusses the results, which provide the following: • Asbestos (fill) • Chlorinated ethene impacted soils • Soils underlying transformers	**Please refer to Section 7**
Results of remediation pilot trials (if applicable)	Not proposed	Not applicable
Conceptual Site Model	Not provided.	Although not included in the RWP, this is outlined in the overarching RAP (JBSG 2019)
Remediation Option Assessment and Remediation Strategy		
Extent of remediation required as outlined in RAP	Section 4 provides the extent of the area requiring remediation, summarised below: • Based on the current data, the extent of remediation area for chlorinated ethene impacted soil (AEC 1) is approximately '650m2 over an average excavation depth of 1.5m and assuming a contingency factor of +50% for depth and/or lateral variation equates to an approximate volume of 1500m3 in situ'. Figure 3 shows the proposed extent of remediation for AEC 1. It is noted that the extent of remediation and/or management of fill material and soils underlying transformer are to be determined following completed of additional assessment.	**Figure 3 does not clearly indicate the extent of remediation proposed.** **Sec 4.2 states that the extent of remediation for AEC1 is not yet defined. The Auditor agrees - remediation may extend further along sewer lines and under buildings that could not be accessed for this round of assessment.** **The extent of asbestos impacted soils (AEC3) is unknown and further investigation is proposed by JBSG (as stated in Sec 4.1)**
Discussion of possible remediation options	Not provided.	Covered in JBS&G (2019) Overarching RAP.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Requirement	Consultant Consideration	Auditor Comment
Selected remediation option	Section 5 states that onsite containment is the preferred remediation option. Materials deemed to be unsuitable to retain onsite will be removed for offsite disposal.	**Considered acceptable, pending additional delineation findings to confirm extent of impact, and confirmation of contaminant behaviour if capped**
Rationale for selected remedial option	Not provided.	Covered in JBS&G (2019) Overarching RAP. Any capping will require a long term Environmental Management Plan (LTEMP). **Groundwater quality requires further assessment which may change the RWP and remedial strategy implemented.**
Description of remediation works:	Section 5 provides description of the remediation works for: • Asbestos impacted soil: • Preferred remediation approach to be determined following completion of additional works. At this stage, a cap and contain is the preferred option. Impacted soil is to be placed beneath a capping layer, with cap thickness of at least 0.5m. A marker layer will be installed prior to placement of the capping layer. • Chlorinated ethene impacted soils • Complete the remainder of pre-remediation investigation to determine the extent of remediation area • Excavate underground utilities, followed by impacted soils within the remediation area. • Materials are to be stored in 70m3 stockpiles for further testing to determine suitability for onsite retention. Unsuitable material will be disposed offsite. • Materials to be retained will be consolidated into a single stockpile prior to final placement within an onsite containment cell. The cell will be at least 30m away from current and future structures and located above the groundwater table. • The cell will be located under future hardstand or placed under a geosynthetic clay liner with a hydraulic conductivity of less than $5x10^{-11}$m/s. A marker layer will be placed prior to the placement of a capping layer of at least 0.5m thick. • Soils underlying transformers will be tested to determine the extent of remediation area (if required).	**Please refer to Section 7 for further comments. The is no consideration for groundwater?**
Validation plan	Section 6 provides validation testing requirement, which includes: • Asbestos impacted soil – to be determined following completion of additional testing. • Chlorinated ethene impacted soils – validation of excavations	**Please refer to Section 7 for further comments.**

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Requirement	Consultant Consideration	Auditor Comment
	- Boreholes will be advanced to facilitate soil vapour probe installation. Probes will be installed to a depth of 1m within the walls or base of excavation. - Soil vapour probes will be left to equilibrate for period of 24 hours prior to sampling. - Probes will be purged using a multi-gas meter for at least 30s. - Leak detection evaluation via placement of an isopropyl alcohol-soaked rag - Sampling will be conducted using a carbon tube via a telfon tubing. - Sampling density will be based on a 10m grid. • Chlorinated ethene impacted soils – validation of suitability for onsite containment - Samples will be collected at a frequency of 70m3 and tested for ASLP. • Validation of soil containment - A location plan with co-ordinates relative to the lot boundaries - The levels in m AHD of the upper surface of the impacted fill materials - Daily inspections by the environmental consultant to record when and where the GCL and marker layer has been installed - The levels in m AHD of the finished barrier layer surface. - Site surveys are to be prepared by a registered surveyor.	
Contingency plan if selected remedial strategy fails	Not provided.	**No contingency presented for groundwater. Further assessment is required as confirmed by NSW EPA.**
Unexpected finds protocol:	Not provided.	Covered in JBS&G (2019) Overarching RAP.
Interim site management plan before remediation	Not provided.	**As conditioned by the Section B SAS, Interim environmental monitoring is to be carried out as described in the JBS&G (5 March 2019) Interim Environmental Monitoring Plan for Shop 3, 140 Henry Street as per the stated frequency up until demolition and remediation of the site commences to ensure no unacceptable exposure to contaminants of concern within indoor air occur. Please confirm that this is occurring and the monitored risk is acceptable.**
Site management plan for remediation works	Not provided	Covered in JBS&G (2019) Overarching RAP.
Regulatory compliance requirements	Not provided.	Covered in JBS&G (2019) Overarching RAP.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Requirement	Consultant Consideration	Auditor Comment
Contact persons	Not provided.	Covered in JBS&G (2019) Overarching RAP but to be updated as the RWP evolves and contractors are appointed.
Community relations (where applicable)	Not provided.	Covered in JBS&G (2019) Overarching RAP.
Staged progress reporting (where applicable)	Not provided	It is understood staged progress reporting is not required.
Environmental management plan requirement	Section 6.3 provides details of requirement of ongoing environmental management plan requirements.	**The Auditor will require the following prior to endorsement of the final LTEMP:** • **Where will the LTEMP be recorded? How will this LTEMP be publicly notified?** • **Mechanism of enforceability is to be clearly stated. Written confirmation of the mechanism is to be provided to the Auditor.** • **Responsibilities – who will be implementing the LTEMP, duties and roles for each party are required to be clearly stated.**
Waste Management		
Waste classification:	Section 5.4 states that waste classification is to be conducted in accordance with NSW EPA (2014) Waste Classification Guidelines.	Acceptable
Material handling and tracking plan:	Not provided.	Covered in JBS&G (2019) Overarching RAP.

6 Auditor Comments

The Auditor has reviewed the JBS&G (18 September 2020) Draft Pre-Remediation Investigation Report and the JBS&G (18 September 2020) Draft RWP against relevant guidelines made or approved by NSW EPA. The reports largely meet the guideline requirements, however, the Auditor provides the following comments:

6.1 JBS&G (18 September 2020) Draft Pre-Remediation Investigation Report

1. General comment: The Auditor notes that the pre-remediation investigation has not been fully completed as per the SAQP due to parts of AEC 1 being occupied and inaccessible. The investigation will be completed once access is obtained. AEC3 and AEC4 also remain as data gaps however, the RWP provides information on how these can be addressed to achieve site suitability.
2. Section 5.1.4 (Define the Study Boundary): JBS&G states that 'the temporal boundaries of this investigation were limited to the period of assessment works. Levels of chlorinated ethenes in soil and soil vapour are not considered sensitive to seasonal influences'. Please provide additional evidence to support this statement (ie, soil vapour concentrations not sensitive to seasonal influences) and that results are representative of worst case scenario (ie,

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

conditions favourable for soil vapour generation). Please discuss weather conditions during the two sampling events.

3. Section 5.2 / Figure 5 (sub-slab / soil vapour assessment): Please confirm the location of SV10. This is not shown in Figure 5. Based on the result table, it appears that SV10 was installed next to SS1.
4. Section 7 (QA/QC):
   a. It is noted that a triplicate sample QA01 was collected, but not included in the tabulated.
   b. Please provide a detailed QA/QC assessment in the final report. It is noted that the field QA/QC RPDs have not been calculated.
5. Section 10 (site characterisation): This section should be updated following the pre-remediation investigation. The draft RWP should also be updated to confirm the extent of remediation area for AEC 1.
6. Appendix D (calibration record): Please provide the calibration record for the GFM500 used during the fieldwork.

<u>JBS&G (18 September 2020) Draft RWP</u>

7. General comment: Please address **comments** in Table 1 of this interim advice.
8. Section 1.2 (objectives): The Auditor notes that this Draft RWP will be revised after completion of the pre-remediation investigation, and as such is considered an evolving document.
9. Section 4.1 (asbestos):
   a. Is JBS&G referring to AEC 4 in the JBS&G (2019) Overarching RAP? The Auditor notes that AEC 4 includes fill material that is currently under buildings which was not assessed at the time of the BS&G (2018) DGI. Please confirm.
   b. If this is a separate AEC, the Auditor agrees with JBS&G's proposal to prepare a sampling plan for asbestos assessment. Combining the investigations for AEC 4 and asbestos assessment is considered acceptable.
10. Section 4.2 (chlorinated ethene impacted soils): It is noted that the trenches created from the excavation of the underground utilities should also be included as part of the remediation area.
11. Section 5.1 (asbestos impacted soils): While noting that the preferred remediation approach will be finalised following completion of the investigation, the following should be taken into consideration:
    a. Should cap and contain be adopted as the preferred approach (particularly for retained asbestos impacted material), the minimum cap thickness should be at least 1m, given the site will be used as a recreational park, in line with WA DoH (2009) recommendation for public open space.
    b. Plantings are anticipated to be included as part of the park construction, which should be taken into consideration when deciding the location of the containment cell. This was discussed in the JBS&G (2019) Overarching RAP.
    c. Detail of the final finishing around services will need to be provided in the revised RWP.
12. Section 5.2.3 (onsite containment):
    a. If the containment cell is to be located beneath hardstand, it will have to be away from current and future service trenches.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

b. Please clarify the reference to $5x10^{-11}$m/s for the clay liner. Is this a product performance specification? If so, please include the specification in the revised RWP.

c. How is the GCL going to be installed? Installation methodology should be included in the revised RWP. Depending on the type of the GCL selected for the site, it may require to be kept moist (the bentonite) to maintain the barrier. Please keep this in mind when designing the containment cell and the cap.

13. Section 5.4 (materials management principal): JBS&G states that 'details of completed additional assessment activities including material characterisation reports will be included in the final validation documentation to be prepared in accordance with the requirements of the RAP JBS&G (2019a)'. The Auditor requires results of the additional assessment activities to be provided for review prior to finalisation of the RWP and not left to the validation reporting.

14. Section 6.1.2 (validation of chlorinated ethene impacted soils): The proposed validation sampling methodology is not consistent with the methodology in the JBS&G (2019) Overarching RAP, which was endorsed by the Auditor in 2019.

    a. Validation of excavation: JBS&G (2019) proposed field screening to be conducted at a density of 1 wall sample per 5 linear metre and 1 base sample per 25m2. Field screening is not included in the Draft RWP. Samples will be analysed and compared to HIL-C. Please justify deviation.

    b. Validation of the final site surface: JBS&G (2019) proposed that upon backfilling the remedial excavation and establishment of approximate final site levels, the final site-surface vapour concentrations will require validation. It is anticipated that final site levels will comprise exposed soils/garden beds. On that basis, validation will require to be undertaken by installation of either permanent or temporary soil-vapour wells on an approximate 10 m grid across the remedial excavation footprint. The vapour probes shall be installed to target soils no deeper than 1 m below the final site levels. A minimum of two rounds of soil-vapour sampling will be conducted per the requirements of the VSAQP. Samples of soil-vapour will be withdrawn from each soil vapour well and submitted for laboratory analysis. Please clarify.

    c. Endorsed analytical suite for soil vapour is VOC 8260 and TRH. ASLP is also to be analysed from soil samples collected from excavation. Please clarify.

    d. Site validation criteria: Section 8.7 JBS&G (2019) details the site validation criteria. Please confirm whether they will be adopted, or provide justification for any deviation. In addition, it is noted that JBS&G proposes 'the validation criteria will be sourced from values provided to ANZG (August 2018) for fresh water ecosystems protective of 95% of species. An attenuation factor of 10 will be applied to the applicable criteria before screening of the validation data given that the containment cell will be placed above the groundwater table and that surface water infiltration will largely eliminated through a GCL membrane or hardstand surface'. This deviates from the endorsed criteria. Please provide clarification why an attenuation factor of 10 was selected. Is this in ANZG?

15. Section 6.1.4 (validation of soil containment): Surveys are required as per Section 8.7.4 JBS&G (2019). Validation report should contain information as described in Section 8.2.6.4 in the JBS&G (2019) Overarching RAP, at a minimum.

16. Section 6.3 (LTEMP): The Auditor will require the following prior to endorsement of the final LTEMP:

    a. Where will the LTEMP be recorded? How will this LTEMP be publicly notified?

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

b. Mechanism of enforceability is to be clearly stated. Written confirmation of the mechanism is to be provided to the Auditor.

c. Responsibilities – who will be implementing the LTEMP, duties and roles for each party are required to be clearly stated.

17. General comment: It is assumed that sampling methodology, QA/QC, decontamination etc, will be conducted as per the JBS&G (2019) Overarching RAP. Please confirm

We request that JBS&G provide responses to the above comments, together with an amended copy of the revised Pre-Remediation Investigation Report and RWP, as appropriate.

7 Closure

This interim advice does not constitute a SAS or a SAR, but rather is provided to assist the Client in the assessment and management of contamination issues at the site. The information provided herein should not be considered pre-emptive of the final Audit conclusions. It represents the Auditor's opinion based on the review of currently available information.

Should you have any queries or wish to discuss any points, please do not hesitate to contact Fiona Wong or the undersigned.

Yours sincerely,

Rebeka Hall
NSW EPA Accredited Site Auditor
Zoic Environmental Pty Ltd

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

JBS&G 58140-134,227
L03 (Responses to IA3 - Penrith City Park) Rev A

8 December 2020

Rebeka Hall
Site Auditor
Zoic Environmental Pty Ltd
Via email: rebeka.hall@zoic.com.au

CC: Wasique Mohyuddin
Major Projects Coorinator
Penrith City Council
Via email: wasique.mohyuddin@penrith.city

Summary of Responses to Interim Advices No. 03
Penrith Central Park Village

Dear Rebeka,

JBS&G Australia Pty Ltd (JBS&G) has been engaged by Penrith City Council (Penrith, the client) to provide environmental consultancy services associated with the proposed redevelopment of the Penrith City Village Park (PCPV). JBS&G has recently been in receipt of:

- Interim Advice 1 (IA3) – Review of Draft Pre-Remediation Investigation and Remedial Work Plan (RWP), Penrith City Park, NSW, 23 October 2020, Zoic Environmental Pty Ltd (Zoic 2020).

Responses to each of the issues raised in the interim advice are detailed following. A revised copy of the Draft Pre-Remediation Investigation (JBS&G 2020a[1]) and Remedial Work Plan (JBSG 2020b[2]) has been prepared consistent with the scope of the actions to address each of the comments in IA3.

IA3 – Draft Pre-Remediation Investigation Report

1. *General comment: The Auditor notes that the pre-remediation investigation report has not been fully completed as per the SAQP due to parts of AEC1 being occupied and inaccessible. The investigation will be completed once access is obtained. AEC3 and AEC4 also remain as data gaps however, the RWP provides information on how these can be addressed to achieve site suitability.*

Comment noted. The investigation of AEC1 will be completed in accordance with the SAQP prior to remediation works, once access is obtained. The RWP has been further updated to provide commentary on the how the data gaps of AEC3 and AEC4 will be addressed following demolition works in which a separate SAQP will be prepared and issued to the Auditor for review prior to sampling works.

2. *Section 5.1.4 (Define the Study Boundary): JBS&G states that 'the temporal boundaries of this investigation were limited to the period of assessment works. Levels of chlorinated ethenes in*

[1] Draft Pre-Remediation Investigation, Penrith Central Park Village, 134 to 144 Henry Street, 42 to 50 Station Street and Allen Place Car Park, JBS&G Australia Pty Ltd, 17 September 2020 (JBS&G 2020a).
[2] Remedial Work Plan, Penrith Central Park Village, 134 to 144 Henry Street, 42 to 50 Station Street and Allen Place Car Park, JBS&G Australia Pty Ltd, 17 September 2020 (JBS&G 2020b).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

soil and soil vapour are not considered sensitive to seasonal influences'. Please provide additional evidence to support this statement (ie, soil vapour concentrations not sensitive to seasonal influences) ad that results are representative of worst case scenario (i.e, conditions favourable for soil vapour generation). Please discuss weather conditions during the two sampling events.

Section 5.1.4 has been updated – seasonal influences are not considered to have a significant impact on the outcomes of the assessment given that the objective of the investigation was to delineate the extent of CE impacted source material within site soils that will require remediation and not assess potential worst case conditions as applicable to vapour intrusion. It is further noted that additional vapour sampling will be undertaken during remediation and subsequent validation activities.

3. *Section 5.2 / Figure 5 (sub-slab / soil vapour assessment): Please confirm the location of SV10. This is not shown in Figure 5. Based on the result table, it appears that SV10 was installed next to SS01.*

Confirming that SV10 was installed adjacent to SS01. Figure 5 has been updated.

4. *Section 7 (QA/QC):*

    a. *It is noted that a triplicate sample QA01 was collected, but not included in the tabulated.*

The results from QA01 (split duplicate sample for SS09) have now been included in Table C. It is noted that the analytical suite on carbon tubes from Envirolab reports less compounds than the primary laboratory Eurofins – however this is not considered to affect the outcomes of the assessment given that the two primary COPCs (TCE and PCE) were reported by both laboratories.

    b. *Please provide a detailed QA/QC assessment in the final report. It is noted that the field QA/QC RPDs have not been calculated.*

Comment noted and agreed – a detailed QA/QC assessment will be completed in the final report, once all the proposed data has been collected. No changes to draft reports.

5. *Section 10 (site characterisation): This section should be updated following the pre-remediation investigation.*

Comment noted. Upon finalisation of the pre-remediation investigation report (following the additional sampling proposed once complete access is gained) the extent of required remediation for AEC1 will be clearly defined in Section 10 as well as the RWP. No changes to draft reports.

6. *Appendix D (calibration record): Please provide the calibration record for the GFM500 used during fieldwork.*

The calibration record has now been provided in Appendix D for the GFM500.

RWP

7. *General comment: Please address comments in Table 1 of this interim advice.*

<u>Comments with Respect to Groundwater</u>

Based on a review of Figure 4b, the extent of CE impacts within groundwater have not been delineated to the north-west of AEC1 (i.e. 129-133 Henry Street). Further delineation of CE impacted groundwater to the north-west of the site will be required to confirm that the CE impacts in groundwater do not pose an unacceptable risk to human health or the environment as consistent with the historical off-site investigation findings to the north of AEC1 (i.e. within 129-133 Henry Street and beyond). It is proposed to prepare an SAQP for the delineation of off-site groundwater impacts that also covers the sampling required for potential impacts associated with AEC3 and AEC4.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

The SAQP will be prepared and issued to the Auditor for review prior to sampling works and will be undertaken during demolition works. Noting that the greatest CE impacts within groundwater (located at JBMW02 – PCE 0.15 mg/L) have likely already been identified, it is considered highly unlikely that the extent of the plume will affect the on-site remediation works proposed in the RWP – where the ongoing source of CE impacts to groundwater will be appropriately remediated. The overarching RAP (JBS&G 2019) provides further contingencies in the unlikely event that the preferred remedial option outlined in the RWP

Interim environmental monitoring within Shop 3, 140 Henry Street

All interim environmental monitoring within Shop 3 was completed at the required frequency. No unacceptable health risks were identified to occupants of the building. It is noted that the shop was recently vacated and that the monitoring has now ceased.

8. *Section 1.2 (objectives): The Auditor notes that this Draft RWP will be revised after completion of the pre-remediation investigation, and as such is considered an evolving document.*

Comment noted and agreed.

9. *Section 4.1 (asbestos):*

    a. *Is JBS&G referring to AEC 4 in the JBS&G (2019) Overarching RAP? The Auditor notes that AEC4 includes fill material that is currently under buildings which was not assessed at the time of JBS&G (2018) DGI. Please confirm.*

Section 4.1 has been updated to confirm that potential asbestos and other COPCs within fill materials that have not been completely assessed is related to AEC 4 in the RAP.

    b. *If this is a separate AEC, the Auditor agrees with JBS&G's proposal to prepare a sampling plan for asbestos assessment. Combining the investigations for AEC4 and asbestos assessment is considered acceptable.*

Comment noted and agreed.

10. *Section 4.2 (chlorinated ethene impacted soils): It is noted that the trenches created from the excavation of the underground utilities should also be included as part of the remediation area.*

Figure 3 has been updated to include the remediation of the sewer – noting that the extent of remediation required around underground utilities will not be known until the trenches are exposed during demolition/remediation works.

11. *Section 5.1 (asbestos impacted soils): While noting that the preferred remediation approach will be finalised following completion of the investigation, the following should be taken into consideration:*

    a. *Should cap and contain be adopted as the preferred approach (particularly for retained asbestos impacted material), the minimum cap thickness should be at least 1 m, given the site will be used as a recreational park, in line with WA DOH (2009) recommendation for public open space.*

Comment noted. Section 5.1 has been updated to include the requirement for a minimum thickness of 1.0 m capping layer.

    b. *Plantings are anticipated to be included as part of the park construction, which should be taken into consideration when deciding the location of the containment cell. This was discussed in the JBS&G (2019) Overarching RAP.*

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

The approximate location of the proposed containment cell is now provided in Figure 4 – where it is noted that the final site surface will be covered in lawn with limited potential for the root systems to extend beyond the depth of the capping layer.

c. *Detail of the final finishing around services will need to be provided in the revised RWP.*

The location of the proposed in ground services is now provided in Figure 4 – where it is not anticipated that they will extend through any potential impacted soils. Notwithstanding, the final dot point in Section 4.1 has been updated to include the requirement to include a marker layer within the base and walls of a service trench – in the unlikely event that it extends through asbestos impacted soils.

12. *Section 5.2.3 (onsite containment):*

    a. *If the containment cell is to be located beneath hardstand, it will have to be away from current and future service trenches.*

Comment noted and agreed. All future service trenches are shown on Figure 4 and the containment cell will be placed outside of these alignments.

    b. *Please clarify the reference to $5x10^{-11}$ m/s for the clay liner. Is this a product performance specification?*

EPA Environmental Guidelines for Solid Waste Landfills 2016 (EPA 2016) recommends a sealing layer with a hydraulic conductivity of less than $1x10^{-9}$ m/s to minimise surface water infiltration into solid waste landfills and the subsequent generation of leachate. The RWP has conservatively recommended a GCL product (Bentofix in which the product specifications are now provided as Appendix A) with a hydraulic conductivity of $5x10^{-11}$ m/s to further minimise surface water infiltration and minimise the generation of leachate through the containment cell.

    c. *How is the GCL going to be installed? Installation methodology should be included in the revised RWP. Depending on the type of GCL selected for the site, it may require to be kept moist (the bentonite) to maintain the barrier. Please keep this in mind when designing the containment cell and the cap.*

The proposed GCL membrane product specifications are provided in Appendix A. The GCL layer is required to be installed in accordance with the manufacturer's instructions with appropriate overlay of 150-300 mm between joints of the GCL. Care will be taken to ensure that there are no cuts/abrasions during installation of the GCL – however it is noted that the product is self-healing and minor cuts/openings will appropriately ameliorate. In addition, Bentofix does not require to be kept most during installation and/or maintenance. The environmental consultant will be required to visually inspect the installation of the GCL and marker layers and provide photographic evidence that it was appropriately installed for inclusion in the validation report. Sections 5.2.3 and 6.1.4 have been updated.

13. *Section 5.4 (materials management principle): JBS&G states that 'details of completed additional assessment activities including material characterisation reports will be included in the final validation documentation to be prepared in accordance with the requirements of the RAP (2019a)'. The Auditor requires results of the additional assessment activities to be provided for review prior to finalisation of the RWP and not left to the validation reporting.*

All sampling results from subsequent pre-remediation investigations will be forwarded to the Auditor for review prior to finalisation of the RWP. However, Section 5.4 is primarily intended for any potential materials that may require off-site disposal (as a result of an unexpected find and/or due to been surplus to site development requirements) during remediation/civil construction works that will be unknown prior to the finalisation of the RWP.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

14. *Section 6.1.2 (validation of chlorinated ethene impacted soils): The proposed validation sampling methodology is not consistent with the methodology in the JBS&G (2019) Overarching RAP, which was endorsed by the Auditor in 2019.*

    a. *Validation of excavation: JBS&G (2019) proposed field screening to be conducted at a density of 1 wall sample per 5 linear metre and 1 base sample per 25 m^2. Field screening is not included in the Draft RWP. Samples will be analysed and compared to HIL-C. Please justify deviation.*

Section 6.1.2 has been updated to be consistent with Section 8.2.6.1 of the RAP (JBS&G 2019) – in which the required field screening, soil and soil vapour sampling is outlined.

    b. *Validation of the final site surface. JBS&G (2019) proposed that upon backfilling the remedial excavation and establishment of approximate final site levels, the final site surface vapour concentrations will require validation. It is anticipated that final site levels will comprise exposed soils/garden beds. On that basis, validation will require to be undertaken by installation of either permanent or temporary soil-vapour wells on an approximate 10 m grid across the remedial excavation footprint. The vapour probes shall be installed to target soils no deeper than 1 m below the final site levels. A minimum of two rounds of soil-vapour sampling will be conducted per the requirements of the VSAQP. Samples of soil-vapour will be withdrawn from each soil vapour well and submitted for laboratory analysis. Please clarify.*

All remedial excavations within AEC1 will be subject to validation sampling (as per Section 6.1.2) and subsequently backfilled with clean materials. In addition, no buildings/structures will be constructed in this portion of the site, where vapour intrusion could potentially occur. As such, it is considered unnecessary to complete validation sampling of the final site surface within the footprint of AEC1.

    c. *Endorsed analytical suite for soil vapour is VOC8260 and TRH. ASLP is also to be analysed from soil samples collected from excavation. Please clarify.*

The validation (for remedial excavations of AEC1) analytical suite for soil vapour will comprise VOC8260 and TRH. In addition, soil samples will be analysed for total VOCs and if there are detectable concentrations of CEs within the sample, will be scheduled for ASLP VOCs for comparison to ANZG (2018) validation criteria.

    d. *Site validation criteria: Section 8.7 JBS&G (2019) details the site validation criteria. Please confirm whether they will be adopted, or provide justification for any deviation. In addition, it is noted that JBS&G proposed 'the validation criteria will be sourced from values provided to ANZG (August 2019) for freshwater ecosystems protective of 95% of species. An attenuation factor of 10 will be applied to the applicable criteria before screening of the validation data given that the containment cell will be placed above the groundwater table and that surface water infiltration will largely eliminated through a GCL membrane or hardstand surface'. This deviates from the endorsed criteria. Please provide clarification why an attenuation factor of 10 was selected. Is this in ANZG?*

The site validation criteria will be consistent with Section 8.7 of the RAP (JBS&G 2019) unless a subsequent quantitative risk assessment is completed in order to derive site specific validation criteria subject to Auditor review and endorsement. In addition, the attenuation factor of 10 has been removed for comparison of leachate analysis (in soils proposed to be retained on site) to ANZG (2018) in order to maintain sufficient conservatism within the remedial approach.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

15. *Section 6.1.4 (validation of soil containment): Surveys are required as per Section 8.7.4 JBS&G (2019). Validation report should contain information as described in Section 8.2.6 in the JBS&G (2019) Overarching RAP, at a minimum.*

Comment noted. Section 6.1.4 has been updated to include survey requirements as consistent with Section 8.7.4 of JBS&G (2019). In addition, Section 6.2 has been updated to make it clear that any relevant survey information will be required to be included in the validation report.

16. *Section 6.3 (LTEMP): The Auditor will require the following prior to endorsement of the final LTEMP:*
    a. *Where will the LEMP be recorded? How will this LTEMP be publicly notified?*
    b. *Mechanism of enforceability is to be clearly stated. Written confirmation of the mechanisms is to be provided to the Auditor.*
    c. *Responsibilities – who will be implementing the LTEMP, duties and roles for each party are required to be clearly stated.*

Comments noted and agreed. It is anticipated that the LTEMP will be included on the Council 10.7 planning certificates and be made legally enforceable by appropriate notification to the regulatory authority (Council). Council as the landowner will be responsible for appropriately implementing the LTEMP.

17. *General comment: It is assumed that sampling methodology, QA/QC decontamination etc, will be conducted as per the JBS&G (2019) Overarching RAP. Please confirm.*

It is confirmed that all procedures with respect to each of these aspects will be consistent with JBS&G (2019).

Should you require clarification, please contact the undersigned on 02 8245 0300 or by email cbielby@jbsg.com.au.

Yours sincerely:

Chris Bielby
Senior Environmental Consultant
JBS&G Australia Pty Ltd

Matthew Bennett, CEnvP SC
Senior Principal Contaminated Land
JBS&G Australia Pty Ltd

Attachments:
Limitations

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Attachment 1 – Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquiries.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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17 December 2020

Wasique Mohyuddin
Penrith City Council
PO Box 60
Penrith NSW 2751

Via email: Wasique.Mohyuddin@penrith.city
cc: CBielby@jbsg.com.au

Dear Wasique,

Re: Interim Advice 1 (IA4) – Review of Revised Draft Pre-Remediation Investigation and Remedial Work Plan (RWP), Penrith City Park, NSW

1 Introduction

Penrith City Council (Council) has commissioned Rebeka Hall of Zoic Environmental Pty Ltd (Zoic), a NSW EPA Auditor accredited (No.0802) under the Contaminated Land Management (CLM) Act 1997, to conduct an Audit for the proposed Penrith City Park located at the corner of Henry and Station Streets, Penrith NSW ("the site"). The future park 'site' is legally identified as:

- Lot 1 in DP254763 – Henry Street (to be west of Lot 1 in DP113118)
- Lot 1 in DP164798 and Lot 1 in DP252457 – 134-138 Henry Street
- Lot 10 and 11 in DP553665 – 142 Henry Street
- Lot 2 in DP 556075 – 144 Henry Street
- Lot 3 in DP1200790 – 42 to 44 Station Street
- Lot 1 in DP 526304 – 48 to 50 Station Street
- Lot E DP 163176 – 46 Station Street
- Western portion of Allen Place Car Park, Gaymark Lane and Allen Place (no lot and DP available)

The site occupies an area of approximately 7,500m^2 and is currently used as commercial, retail and car parking area.

The proposed development will comprise a large open recreational space, consisting a mixture of paved and grassed areas including shallow/deep planted gardens and potentially raised garden boxes.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

The aim of the Audit engagement is to enable a site audit statement (SAS) and associated site audit report (SAR) to be prepared that confirms the suitability of the site for the proposed open recreational space at the completion of remedial works. This audit is being conducted in accordance with the requirements outlined in the NSW EPA (2017) Contaminated Land Management Guidelines for the NSW Site Auditor Scheme (3rd edition).

2 Current Interim Advice

The Auditor had previously issued IA1 (9 April 2020) and IA2 (11 May 2020) on the JBS&G Sampling Analysis and Quality Plan (SAQP). The JBS&G (1 May 2020) SAQP was prepared for the pre-remediation assessment of soil underlying 134-138 and 140 Henry Street, referred to as Area of Environmental Concern 1 (AEC1). This was a requirement of the Auditor endorsed Remediation Action Plan (RAP)[1].

The objective of the pre-remediation assessment was to inform the extent of remediation required for AEC1. AEC1 is the portion of the site impacted by contaminants associated with former dry-cleaning operations. The other 3 AECs (AEC2-former service station to the east; AEC3-soils under transformers; AEC4-unknown quality of fill material underlying buildings and pavement) identified in the RAP do not form part of the current pre-remediation assessment.

After the finalisation of the SAQP, JBS&G commenced the pre-remediation assessment of AEC1 aimed at determining the extent of remediation required. As some of the commercial/retail shops were occupied at the time of their investigation the complete scope of fieldwork could not be completed.

JBS&G prepared the Draft Pre-remediation Investigation Report (dated 17 September 2020) based on the works achieved and the Draft Remedial Action Plan (dated 17 September 2020), which the Auditor had reviewed and provided comments in IA3 (23 October 2020).

In preparing this interim audit advice, the Auditor has reviewed the following updated and revised documentation:

- JBS&G Australia Pty Ltd (JBS&G, 8 December 2020) Pre-Remediation Investigation, Penrith Central Park Village, Ref: 58140/131749 Rev B.
- JBS&G (8 December 2020) Remedial Work Plan (RWP), Penrith Central Park Village, Ref: 58140/132003 Rev B, referred to as the JBS&G (8 December 2020) Revised Draft RWP.
- JBS&G (8 December 2020) Summary of Responses to Interim Advice No 3, Penrith Central Park Village, Ref: 58140-134,227.

The purpose of the current IA is to document Auditor findings following review of the Revised Draft documents and JBS&G's response to IA3. The Auditor notes that no additional works were conducted since the issue of the original JBS&G (18 September 2020) Draft Pre-remediation

[1] In September 2017, Zoic was commissioned by Council to complete a Section B Site Audit (Zoic Ref: 19124) for the Central City Park development (for both the Future Park (western portion) and Developable Area (eastern portion)). At the end of the site audit, a Site Audit Statement (SAS) was issued, certifying that, in the opinion of the Auditor that the site can be made suitable for the proposed development if the site is remediated in accordance with the JBS&G (5 March 2019) Penrith Central Park Village Overarching Remedial Action Plan 114 to 146 Henry Street, 42 to 50 Station Street, and Allen Place Car Park (Ref: 55073/120362 Rev 0) subject to compliance with conditions as stated in the Site Audit Statement.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Investigation Report. It is understood that the works will resume in February 2021 when the remainder of the tenants vacant the site.

The JBS&G (8 December 2020) Revised Draft RWP covers the following AECs which were identified in the JBS&G (5 March 2019) Overarching Remedial Action Plan (Ref: 55073/120362 Rev 0), and which was endorsed by the Auditor with the Section B Site Audit Statement (17124 SAS116, dated 18 April 2019): The RAP is referred to as the JBS&G (2019) Overarching RAP in this interim advice:

- AEC 1 – Chlorinated ethene impacted soil
- AEC 3 – Soils underlying transformer
- AEC 4 – Fill material underlying buildings and pavement

It is noted that AEC 2 (former service station) is located outside of the proposed Penrith City Park development area.

3 Review of JBS&G (8 December 2020) Revised Draft Remedial Works Plan

The JBS&G (8 December 2020) Revised Draft RWP has been audited in accordance with the requirements outlined in EPA (2017) Contaminated Land Management Guidelines for the NSW Site Auditor Scheme (3rd edition), Consultants Reporting on Contaminated Land Contaminated Land – Contaminated Land Guidelines and with consideration of the amended NEPC (1999) National Environment Protection (Assessment of Site Contamination) Measure, Schedule A and Schedules B(1)-B(9) by National Environment Protection Council, Adelaide (April 2013). A summary of the document review is presented in Table 1 attached.

4 Auditor Comments

The Auditor has reviewed the JBS&G (8 December 2020) Revised Draft Pre-Remediation Investigation Report, JBS&G (8 December 2020) Revised Draft RWP and JBS&G (8 December 2020) JBS&G Response to IA03 against relevant guidelines made or approved by NSW EPA. The reports largely meet the guideline requirements, however, the Auditor provides the following comments:

4.1 Overall Comment

1. General comment (site boundary): The Auditor notes that the site boundary in the JBS&G (8 December 2020) Revised Draft Pre-Remediation Investigation Report and JBS&G (8 December 2020) Revised Draft RWP have been revised since the issue of the last draft reports. It is noted that the new boundary is still within the Audit Boundary covered by the Section B site audit issued by the Auditor in 2019 (SAS No SAS116). Therefore, the endorsed JBS&G (2019) Overarching RAP applies to the new site boundary.

4.2 JBS&G (8 December 2020) Revised Draft Pre-remediation Investigation Report

2. Section 5.1.4 (define the study boundary): The Auditor does not agree with JBS&G's response to IA3 with respect to seasonal influences on investigation activities. Soil vapour conditions are affected by changes in climatic conditions. At the end of all sampling activities, the Auditor requires JBS&G to provide evidence to confirm results monitored are representative of worst case scenario.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3. Appendix D (calibration certificate): It is noted that the gas analyser used is a GFM435. Please ensure a correct calibration certificate is included in the final report, or the correct equipment is referenced in the main text. Section 5.2.3 states that a GFM500 was used.

4.3 JBS&G (8 December 2020) Revised Draft RWP

4. Section 5.2.3 (onsite containment): The specification provided in Appendix A states that the hydraulic conductivity is 1 x 10^{-14} m/s, not 5 x 10^{-11} m/s. The specification attached appears to contain several different Bentofix grade. Please specify which product JBS&G is proposing to use in the Final RWP.

   With respect to geofabric marker layer, WA DoH 2009 states that it must be: water permeable; high visibility; rot proof and chemically inert; and high tensile strength.

   The above information should be included in the Final RWP.

5. Section 6.1.2 (validation of chlorinated ethene impacted soils): The Auditor has reviewed this section and notes the following:

   a. Final extent of excavation will be informed by a combination of soil and soil vapour sampling. JBS&G states that works to be conducted as per Section 8.2.6.1 in the JBS&G (2019) however, the following discrepancies were noted:

      i. Temp soil vapour probes were proposed to be installed at a rate of 1 per 5m excavation wall, with a min of 1 per wall; and at a rate of 1 per 25m2 base, with a minimum of 4 per excavation. This has not been included in the JBS&G (2020) Revised RWP.

      ii. In JBS&G (8 December 2020) JBS&G Response to IA3, JBS&G considers that the final site surface is no longer required to be validated within footprint of AEC 1 as 'all remedial excavations within AEC1 will be subject to validation sampling (as per Section 6.1.2) and subsequently backfilled with clean materials. In addition, no buildings/structures will be constructed in this portion of the site, where vapour intrusion could potentially occur'.

   The Auditor requires the final validation sampling densities to be confirmed in the Final RWP, following completion of the pre-remediation investigations on determining the final extent of remediation for this AEC and the final location of the containment area.

The above comments are to be incorporated by JBS&G into conducting future site delineation works and in finalising the RWP.

5 Auditor Conclusions

The Auditor considers that the JBS&G (8 December 2020) Revised Draft RWP provides an adequate remedial strategy for the contamination confirmed at the site, to be implemented with the endorsed JBS&G (2019) Overarching RAP, subject to the following conditions:

1. Completion of the remaining pre-remediation investigations and groundwater assessment following site vacation in February 2021. A SAQP is to be provided to the Auditor for review prior to the commencement of the following:

   a. Delineation of chlorinated ethene groundwater contamination and offsite migration

   b. Assessment of fill material under buildings (AEC 4), which should be designed based on the sampling plan as described in Section 7.6.3 of the JBS&G (2019) Overarching RAP and observation made on site surface following removal of existing hardstand onsite (AEC4),

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

including the concrete slab within the western portion of Allen Place carpark which is now part of the site.

2. Upon completion of the Pre-remediation investigation works, a copy of the final draft report is to be submitted to the Auditor for review. The report should include a complete set of data gap investigations and findings of the investigation.
3. The JBS&G (8 December 2020) Revised Draft RWP is to be updated and finalised following completion of the pre-remediation investigations and reporting. The Auditor requires the following information to facilitate the review:
   a. Confirmation of the final extent of remedial works for each AEC that is required to achieve the remedial goals
   b. Preferred remedial option for each AEC. For chlorinated ethene impacted soils (AEC 1), validation sampling and cap and contain strategy are to be presented.
   c. Final validation plan for each AEC, final site layout and final location of the containment area.
   d. Any deviation to the endorsed site validation criteria, as described in Section 8.7 of the JBS&G (2019) Overarching RAP will require to be submitted to the Auditor for endorsement for approval in advance.
4. Should a cap and contain strategy be adopted at the site, a Long Term Environmental Management Plan (LTEMP) will be required. Mechanism of enforceability and public notification will need to be confirmed and clearly stated in the LTEMP.
5. No remediation works are to commence without completion of remaining pre-remediation investigations and the finalisation of the Remedial Works Plan being endorsed by the Auditor.

6 Closure

This interim advice does not constitute a SAS or a SAR, but rather is provided to assist the Client in the assessment and management of contamination issues at the site. The information provided herein should not be considered pre-emptive of the final Audit conclusions. It represents the Auditor's opinion based on the review of currently available information.

Should you have any queries or wish to discuss any points, please do not hesitate to contact Fiona Wong or the undersigned.

Yours sincerely,

Rebeka Hall
NSW EPA Accredited Site Auditor
Zoic Environmental Pty Ltd

Attachments:
Table 1: Evaluation of JBS&G (8 December 2020) Revised Draft RWP

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 1: Evaluation of JBS&G (8 December 2020) Revised Draft RWP

Requirement	Consultant Consideration	Auditor Comment
Objectives:	Section 1.2 states that the objectives of the remediation were to 'render the site suitable for the proposed use'. JBS&G states that 'this RWP will be revised upon receipt of the additional investigation results proposed to be completed prior to remediation works as outlined in JBS&G (2020)'.	Auditor notes: • Further data gap investigation is proposed to determine the extent of remedial works required for AEC 1 (chlorinated ethene impacted soils) • Further data gap investigation is proposed to determine the extent of remedial works required for AEC3 (transformer footprint) and AEC4 (fill material). A SAQP will be prepared and issued to the Auditor for review and endorsement prior to works commencing. • Delineation of groundwater impact and/or offsite migration is to be conducted during demolition works. A SAQP will be prepared and issued to the Auditor for review and endorsement prior to works commencing. **The RWP will be an evolving document as new information is obtained.**
Scope of work	Section 4 states that the scope includes: • Remediation of fill material underlying buildings, noting that further assessment will be required to determine the nature and extent of the remedial works • Remediation of chlorinated ethene impacted soils • Remediation and/or management of soils underlying transformer	Acceptable, noting further characterisation is required for AECs 1, 3 and 4 as well as addressing groundwater conditions.
Site identification	Section 2.1 provides site identification details.	Acceptable
Site history	Not provided.	Although not included in the RWP, this is outlined in the overarching RAP (JBSG 2019)
Site condition and surrounding environment	Not provided.	Although not included in the RWP, this is outlined in the overarching RAP (JBSG 2019)
Remediation criteria	Soil remediation criteria have not been included as onsite containment is the preferred option. For chlorinated ethene impacted soil, ASLP results will be compared to ANZG (2018) for freshwater ecosystems protective of 95% of species. An attenuation factor of 10 will be applied to the applicable criteria before screening of the validation data given that the containment cell will be placed above the groundwater table and that surface water infiltration will largely eliminated through a GCL membrane or hardstand surface Section 6.1.2 states that 'validation criteria for the excavation extent is to be agreed with the site auditor prior to implementation'.	In JBS&G (8 December 2020) Response to IA3, JBS&G states that 'the site validation criteria will be consistent with Section 8.7 of the RAP (JBS&G 2019) unless a subsequent quantitative risk assessment is completed in order to derive site specific validation criteria subject to Auditor review and endorsement. In addition, the attenuation factor of 10 has been removed for comparison of leachate analysis (in soils proposed to be retained on site) to ANZG (2018) in order to maintain sufficient conservatism within the remedial approach.' In Section 8.7 of the JBS&G (2019) RAP, for chlorinated ethene impact validation works, JBS&G states that 'the specific requirements for this assessment shall be detailed in a the VVSAQP, either included within the stage specific RWPs or to be issued separately, to the Site Auditor subsequent to delineation of soil-vapour impact. The RWPs/VVSAQP will include PID action criteria to guide field screening assessment'.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Requirement	Consultant Consideration	Auditor Comment
Results	Tabulated results and figures have not been included. Section 4 discusses the results, which provide the following: • Fill material underlying buildings (AEC 4) • Chlorinated ethene impacted soils (AEC 1) • Soils underlying transformers (AEC 3)	Results are to be included the final RWP.
Results of remediation pilot trials (if applicable)	Not proposed	Not applicable
Conceptual Site Model	Not provided.	Although not included in the RWP, this is outlined in the overarching RAP (JBSG 2019)
Remediation Option Assessment and Remediation Strategy		
Extent of remediation required as outlined in RAP	Section 4 provides the extent of the area requiring remediation, summarised below: • Based on the current data, the extent of remediation area for chlorinated ethene impacted soil (AEC 1) is approximately '650m2 over an average excavation depth of 1.5m and assuming a contingency factor of +50% for depth and/or lateral variation equates to an approximate volume of 1500m3 in situ'. Figure 3 shows the proposed extent of remediation for AEC 1. It is noted that the extent of remediation and/or management of fill material and soils underlying transformer are to be determined following completed of additional assessment.	Section 4.2 states that the extent of remediation for AEC 1 is not yet defined. The Auditor agrees - remediation may extend further along sewer lines and under buildings that could not be accessed for the most recent round of assessment. The extent of soil underlying transformers (AEC 3) and fill impacted soils (AEC 4) are unknown and further investigation is proposed by JBSG (as stated in Sec 4.1)
Discussion of possible remediation options	Not provided.	Covered in JBS&G (2019) Overarching RAP.
Selected remediation option	Section 5 states that onsite containment is the preferred remediation option. Materials deemed to be unsuitable to retain onsite will be removed for offsite disposal.	Considered acceptable, pending additional delineation findings to confirm extent of impact, and confirmation of contaminant behaviour if capped. Any material that is contained and capped on site must not leach to protect the underlying groundwater.
Rationale for selected remedial option	Not provided.	Covered in JBS&G (2019) Overarching RAP. Any capping will require a long term Environmental Management Plan (LTEMP). Groundwater quality requires further assessment. Depending on those findings the RWP may need revision.
Description of remediation works:	Section 5 provides description of the remediation works for: • Chlorinated ethene impacted soils (AEC 1) - Complete the remainder of pre-remediation investigation to determine the extent of remediation area	Considered acceptable, noting that further investigation will be conducted to confirm the extent of the remediation works required at the site.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Requirement	Consultant Consideration	Auditor Comment
	- Excavate underground utilities, followed by impacted soil. - Materials are to be stored in 70m3 stockpiles for further testing to determine suitability for onsite retention. Unsuitable material will be disposed offsite. - Materials to be retained will be consolidated into a single stockpile prior to final placement within an onsite containment cell. The cell will be at least 30m away from current and future structures and located above the groundwater table. - The cell will be located under future hardstand or placed under a geosynthetic clay liner with a hydraulic conductivity of less than $5x10^{-11}$m/s. A marker layer will be placed prior to the placement of a capping layer of at least 1m thick. A marker layer will be placed between the GCL and capping layer. • Soils underlying transformers (AEC 3) will be tested to determine the extent of remediation area (if required). • Fill impacted soil (AEC 4): - The preferred remediation approach will be determined following the completion of additional works. At this stage, a cap and contain is the preferred option. Impacted soil is to be placed beneath a capping layer, with cap thickness of at least 1m. A marker layer will be installed prior to placement of the capping layer. • In JBS&G (8 December 2020) Response to IA3, JBS&G states that 'delineation of groundwater impact and/or offsite migration is to be conducted during demolition works. A SAQP will be prepared and issued to the Auditor for review' and endorsement prior to works commencing.	
Validation plan	Section 6 provides validation testing requirement, which includes: • Impacted fill material – to be determined following completion of additional testing. • Chlorinated ethene impacted soils – validation of excavations - Boreholes will be advanced to facilitate soil vapour probe installation. Probes will be installed to a depth of 1m within the walls or base of excavation. - Soil vapour probes will be left to equilibrate for period of 24 hours prior to sampling. - Probes will be purged using a multi-gas meter for at least 30s. - Leak detection evaluation via placement of an isopropyl alcohol-soaked rag	The Auditor has reviewed this section and notes the following: • Final extent of excavation will be informed by a combination of soil and soil vapour sampling. JBS&G states that works are to be conducted as per Section 8.2.6.1 in the JBS&G (2019) however, the following discrepancies were noted: - The installation of temporary soil vapour probes were proposed at a rate of 1 per 5m excavation wall, with a min of 1 per wall; and at a rate of 1 per 25m2 base, with a minimum of 4 per excavation. This has not been included in the JBS&G (2020) Revised RWP. The Auditor requires the final validation sampling densities to be confirmed in the final Remedial Works Plan, following completion of the pre-remediation investigations to close out the current data gaps in delineation.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Requirement	Consultant Consideration	Auditor Comment
	- Sampling will be conducted using a carbon tube via a telfon tubing. - Final sampling density will be based on a 10m grid for soil vapour. - In addition, soil samples will also be collected from the wall and base of excavation at a frequency of 1 sample per 5 linear metre per wall and 1 per 25m2 for base sample. - Soil vapour samples will be analysed for TRHs and VOCs. If chlorinated ethenes are present, ASLP will also be tested. • Chlorinated ethene impacted soils – validation of suitability for onsite containment - Samples will be collected at a frequency of 70m3 and tested for ASLP. - CE impacted soils containment cell will be at least 30m away from current/future structures. • Validation of soil containment - A location plan of the placed materials with co-ordinates based on an agreed grid system (e.g., GPS or relative to the lot boundaries) - The levels in m AHD of the base of the placement location(s) prior to the material placement - The levels in m AHD of the placement locations once all materials have been placed - Daily inspections by the environmental consultant to record when and where the GCL and marker layer has been installed - The levels in m AHD of the finished barrier layer surface - Subsequently the total placed volume of materials - Site surveys are to be prepared by a registered surveyor.	
Contingency plan if selected remedial strategy fails	Not provided.	No contingency presented for groundwater. This should be updated following completion of pre-remediation investigation and groundwater assessment works
Unexpected finds protocol:	Not provided.	Covered in JBS&G (2019) Overarching RAP.
Interim site management plan before remediation	In JBS&G (8 December 2020) Response to IA3, JBS&G states that 'all interim environmental monitoring within Shop 3 was completed at the required frequency. No unacceptable health risks were identified to occupants of the building. It is noted that the shop was recently vacated and that the monitoring has now ceased'.	Noted.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Requirement	Consultant Consideration	Auditor Comment
Site management plan for remediation works	Not provided	Covered in JBS&G (2019) Overarching RAP.
Regulatory compliance requirements	Not provided.	Covered in JBS&G (2019) Overarching RAP.
Contact persons	Not provided.	Covered in JBS&G (2019) Overarching RAP but to be updated as the RWP evolves and contractors are appointed.
Community relations (where applicable)	Not provided.	Covered in JBS&G (2019) Overarching RAP.
Staged progress reporting (where applicable)	Not provided	It is understood staged progress reporting is not required.
Environmental management plan requirement	Section 6.3 provides details of requirement of ongoing environmental management plan requirements. Furthermore, in JBS&G (8 December 2020) Response to IA3, JBS&G states that 'it is anticipated that the LTEMP will be included on the Council 10.7 planning certificates and be made legally enforceable by appropriate notification to the regulatory authority (Council). Council as the landowner will be responsible for appropriately implementing the LTEMP. It is anticipated that the LTEMP will be included on the Council 10.7 planning certificates and be made legally enforceable by appropriate notification to the regulatory authority (Council). Council as the landowner will be responsible for appropriately implementing the LTEMP'.	Any LTEMP must be publicly notified (e.g. Sec 10.7 certificate) and legally enforceable. Stating that the LTEMP will be 'made legally enforceable by appropriate notification to the regulatory authority (Council)' **is not a legal** mechanism. A condition in the DA consent for the requirement of a LTEMP to manage residual is a mechanism for legal enforcement.
Waste Management		
Waste classification:	Section 5.4 states that waste classification is to be conducted in accordance with NSW EPA (2014) Waste Classification Guidelines.	Acceptable
Material handling and tracking plan:	Not provided.	Covered in JBS&G (2019) Overarching RAP.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Appendix K Construction Noise & Vibration Management Plan

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Construction Noise & Vibration Management Plan

City Park, Penrith, NSW

Client:
JBS&G

11 December 2020

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Document	Rev	Date	Prepared	Checked	Authorised	Approved
5076R001.JC.201203	0	11 December 2020	JC	RH	RH	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

CONTENTS

Glossary 4
1 Introduction 5
1.1 Summary 5
1.2 Location of Proposed Development 5
2 Assessment Criteria and Standards 6
2.1 Assessment Criteria 6
2.2 Penrtih City Council Criteria 6
2.3 Australian Standards 7
2.4 NSW EPA Interim Construction Noise Guideline 8
2.5 Construction Vibration Criteria 9
3 Procedures and Implementation 12
3.1 Instrumentation & Measurement Standards 12
4 Methodology For Emission Predictition and Assessment 12
5 Noise & Vibration Emission Prediction and Assessment 13
5.1 Noise Emission Prediction Calculations and Modelling 14
5.2 Noise Emission Assessment 16
5.3 Vibration Emission Prediction Calculations and Modelling 16
6 Discussion and Recommendations 17
6.1 Noise and Vibration Induction of All Site Staff 18
6.2 Implementation of Community Liason Procedure 18
6.3 Use of Temporary Noise Barriers 19
6.4 Use of Quietest Available Equipment for Works 19
6.5 Implementation Of a Noise & Vibration Monitoring And Reporting Programme 20
6.6 An Appropriate Excavation Methodology 20
6.7 Preparation of a Dilapidation Survey of Adjacent Buildings and Structures 20
6.8 Provision of Respite Periods During Intensive Activities 20
7 Conclusion 21

Appendix A - Location Map, Aerial Photo & Site Plan ..... 2 pages

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

GLOSSARY

NOISE

Noise is produced through rapid variations in air pressure at audible frequencies (20 Hz – 20 kHz). Most noise sources vary with time. The measurement of a variable noise source requires the ability to describe the sound over a particular duration of time. A series of industry standard statistical descriptors have been developed to describe variable noise, as outlined in Section 2 below.

NOISE DESCRIPTORS

L_{eq} – The sound pressure level averaged over the measurement period. It can be considered as the equivalent continuous steady-state sound pressure level, which would have the same total acoustic energy as the real fluctuating noise over the same time period.

$L_{Aeq(15\ min)}$ – The A-weighted equivalent continuous sound level over a 15 minute period.

L_{A90} – The A-weighted noise level that has been exceeded for 90% of the measurement duration.

dB – Decibels. The fundamental unit of sound, a Bell is defined as the logarithm of the ratio of the sound pressure squared over the reference pressure squared. A Decibel is one-tenth of a Bell. Probably the most common usage of the Decibel in reference to sound loudness is dB sound pressure level (SPL), referenced to the nominal threshold of human hearing. For sound in air and other gases, dB(SPL) is relative to 20 micropascals (μPa) = 2×10^{-5} Pa, the quietest sound a human can hear.

A-WEIGHTING

"A-weighting" refers to a prescribed amplitude versus frequency curve used to "weight" noise measurements in order to represent the frequency response of the human ear. Simply, the human ear is less sensitive to noise at some frequencies and more sensitive to noise at other frequencies. The A-weighting is a method to present a measurement or calculation result with a number representing how humans subjectively hear different frequencies at different levels.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1 INTRODUCTION

1.1 SUMMARY

Acoustic Dynamics is engaged by **JBS&G** on behalf of Penrith City Council to assess and, where required, make recommendations to reduce and manage the noise and vibration impact at the nearest potentially affected receivers resulting from the demolition, excavation and construction works, and associated activities, for the proposed parkland development located at the corner of Henry Street and Station Street, Penrith, NSW, in accordance with the requirements of Penrith City Council.

The proposal is for the demolition of the existing structures from 134 to 144 Henry Street, and 44 to 50 Station Street, and the construction of a city park.

This report presents the relevant construction noise and vibration emission objectives, construction noise and vibration prediction calculations, an impact assessment and recommendations for mitigation and management measures to be implemented, to minimise the potential for adverse impact at the nearest potentially affected receivers, resulting from excavation and construction works.

This report is prepared in accordance with the requirements and guidelines of Penrith City Council, the NSW Environment Protection Authority (EPA), and relevant Australian Standards.

1.2 LOCATION OF PROPOSED DEVELOPMENT

The proposed development is to be located at the corner of Henry Street and Station Street, Penrith, NSW. The proposed development is a public park for the greater community.

All boundaries of the site are shared with streets, with Henry Street to the north, Station Street to the West, Allen Place and the Allen Place carpark to the south, and Gaymark Lane to the East. The nearest receivers are commercial developments, with the nearest residence 160 metres to the south west of the subject site.

The surrounding commercial receivers located along Station Street, Henry Street, Gaymark Lane and Allen Place are deemed to be the nearest potentially affected receiver locations.

The proposed development is shown in the Location Map & Drawings presented within **Appendix A**.

Based on information provided by the proponent, Acoustic Dynamics advises that demolition works would approximately occur for 1 month, excavation works would occur for 3 months, and construction works to occur for 3 months, during the daytime hours only.

Acoustic Dynamics is advised that use of noise generating equipment during the proposed works will be undertaken between the following operating hours, as shown in **Table 1.1**.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 1.1 Operating Hours of Noise Generating Equipment

Activity	Permitted Work Hours
All building, construction and site work, including site deliveries (except as detailed below)	• Monday to Friday – 7:00am to 5:00pm • Saturday – 8:00 am to 1:00 pm • Sunday & public holidays – No work permitted
Excavating of rock, use of jack-hammers, pile-drivers or the like	• Monday to Friday – 7:00am to 5:00pm • Saturday – 8:00 am to 1:00 pm • Sunday & public holidays – No work permitted

2 ASSESSMENT CRITERIA AND STANDARDS

2.1 ASSESSMENT CRITERIA

The following sections outline the relevant construction noise emission criteria and conditions applicable to the works.

2.2 PENRTIH CITY COUNCIL CRITERIA

2.2.1 LOCAL ENVIRONMENTAL PLAN & DEVELOPMENT CONTROL PLAN

Acoustic Dynamics has conducted a review of the following documents:

- Penrith Development Control Plan (DCP) 2014; and
- Penrith Local Environmental Plan (LEP) 2010.

A review of the DCP and LEP documents found no specific criteria relating to the management and mitigation of noise during excavation or construction.

2.2.2 COUNCIL REQUESTS

Acoustic Dynamics understands Penrith City Council made the following request prior to submission of the Stage 1 application in relation to noise and vibration emission during construction:

"Noise Impacts
Given the scale of the demolition works proposed, and the potential for significant excavation as part of the remediation works, an acoustic assessment is to be submitted as part of the Stage 1 application to demonstrate that the proposed development will not have any impact on nearby sensitive receivers. This report is to be prepared by an appropriately qualified acoustic consultant and is to consider the Interim Construction Noise Guideline in assessing the noise and vibration impacts associated with the demolition and remediation works

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

proposed. Should mitigation measures be necessary, recommendations should be included to this effect."

2.3 AUSTRALIAN STANDARDS

Acoustic Dynamics has conducted a review of relevant Australian Standards in relation to the subject development. The following details this review.

2.3.1 AS2436 *"GUIDE TO NOISE CONTROL ON CONSTRUCTION ... SITES"*

Australian Standard 2436-2010: *"Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites"* provides guidance on noise control in respect of engineering construction, maintenance and demolition works, including guidance in investigation and identification of noise sources, measurement of sound, and it's assessment, with a view to planning of measures for noise control.

Acoustic Dynamics advises that AS 2436 contains the following information relating to appropriate noise emission goals for construction sites:

> ***"3.2 NOISE AND VIBRATION IMPACTS ON THE COMMUNITY***
>
> *Whether or not noise from a construction, maintenance or demolition site is likely to constitute a problem depends upon a number of considerations, such as –*
>
> *(a) existing background noise level;*
> *(b) distance between the site and the areas likely to be affected by the construction noise;*
> *(c) nature of buildings and the activity therein, where the noise is likely to be heard;*
> *(d) the likely duration of construction, maintenance and demolition operations and the hours during which the above operations will be carried out (whether during the day, night or weekends);*
> *(e) the nature of the noise, e.g. audible pure tone components and impulsive character; and*
> *(f) the number of items of major plant and equipment being utilized simultaneously on the site for their cumulative impact.*
>
> *Some construction or demolition activities are by their very nature noisy. The authorities responsible for setting noise level criteria for essential works will take note of the constraints imposed by such activities, especially when they are of short duration."*

Acoustic Dynamics advises that determination of appropriate noise emission goals for the proposed works in accordance with the EPA's guidelines will satisfy the recommendations and guidelines detailed within AS 2436.

We advise that assessment of the proposed works, detailed within this document, has been carried out in accordance with the information and guidelines detailed within AS 2436.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2.4 NSW EPA INTERIM CONSTRUCTION NOISE GUIDELINE

In this section, the relevant construction noise emission criteria and conditions applicable to the works are outlined, based on the NSW Environment Protection Authority's (EPA's) *Interim Construction Noise Guideline* (ICNG).

The NSW EPA's ICNG is developed to manage noise from construction works. The ICNG advises that a quantitative methodology of assessment of construction noise emission may be undertaken for long-term (greater than three weeks) works.

Acoustic Dynamics advises that the most appropriate methodology for the assessment of noise emission from the proposed works is a quantitative assessment, to ensure noise emission from the works is minimised. Note should be made that the ICNG states that when developing noise mitigation strategies for reducing construction noise emission focus should be given to *"applying all 'feasible' and 'reasonable' work practices to minimise construction noise impacts"*.

Accordingly, relevant noise emission goals have been determined for the proposed works, in accordance with the information contained within the ICNG, which should be achieved where possible.

The ICNG provides information on management levels (noise emission goals) for construction noise emission at residential receivers, and other various sensitive receivers. The management noise levels at residential receivers are dependent upon the relevant rated background level (RBL) at the residential receiver, and the time of day that the construction noise is to be generated.

Acoustic Dynamics has determined the daytime background noise environment at the nearest residential receivers, as referred to in the EPA's ICNG. The results of operator-attended noise measurements in the area on Monday 30 November 2020 are presented in **Table 2.1**.

Table 2.1 Measured Ambient Noise Environment

Location	Period	Measured Noise Levels [dB][1]	
		RBL (L_{A90})	L_{Aeq}
Nearest Receivers (Allen Place)	Daytime	51	61
Nearest Receivers (Henry Street)		60	67

Note: 1) Measured noise levels are ambient, and do not include any subject works or associated activities.
2) Works at the site will not take place outside daytime hours of 7am to 5pm Monday to Saturday.

Based on the measured background noise environment, **Table 2.2** presents the construction noise emission management levels/objectives, as detailed in the EPA's ICNG, for the nearest receivers:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 2.2 Site Specific Construction Noise Objectives at Residential Receivers

Time of Day	EPA Management Level ($L_{Aeq\ (15\ min)}$)	Site specific construction noise emission goals $L_{Aeq\ (15\ min)}$ [dB]
Recommended Standard Hours: Monday to Friday 7am to 4pm Saturday 8am to 3pm No work on Sundays or Public Holidays	Offices, Retail Outlets	**70**

Note: 1) Works at the site are not expected to take place outside recommended standard hours.

Based on the information contained within the EPA's ICNG, Acoustic Dynamics recommends that noise emission from the proposed works achieves the following noise emission goals, when possible.

Note should be made that as night-time works are not expected to occur, the assessment of sleep disturbance is not warranted.

2.5 CONSTRUCTION VIBRATION CRITERIA

Structural and cosmetic damage vibration criteria are guided by the vibration levels presented within the standards BS 7385 and DIN 4150 and the NSW EPA document *"Assessing Vibration - a technical guide"*.

In terms of the most recent relevant vibration damage criteria, British Standard 7385: Part 2-1993 "Evaluation and measurement for vibration in buildings Part 2 - Guide to damage levels from ground-borne vibration" *represents a definitive standard against which the likelihood of building damage from ground vibration can been assessed.*

Although there is a lack of reliable data on the threshold of vibration-induced damage in buildings both in countries where national standards already exist and in the UK, BS 7385: Part 2 has been developed from an extensive review of UK data, relevant national and international documents and other published data.

The standard sets guide values for building vibration based on the lowest vibration levels above which damage has been credibly demonstrated. These levels are judged to give a minimum risk of vibration-induced damage, where minimal risk for a named effect is usually taken as a 95% probability of no effect.

Sources of vibration, which are considered in the standard, include blasting (carried out during mineral extraction or construction excavation), excavation, piling (sheet, bored, contiguous), ground treatments (e.g. compaction), construction equipment, tunnelling, road and rail traffic and industrial machinery.

The guide values from this standard for transient vibration judged to result in a minimal risk of cosmetic damage to residential buildings and industrial buildings are presented numerically in **Table 2.3** and graphically in **Figure 2.4**.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

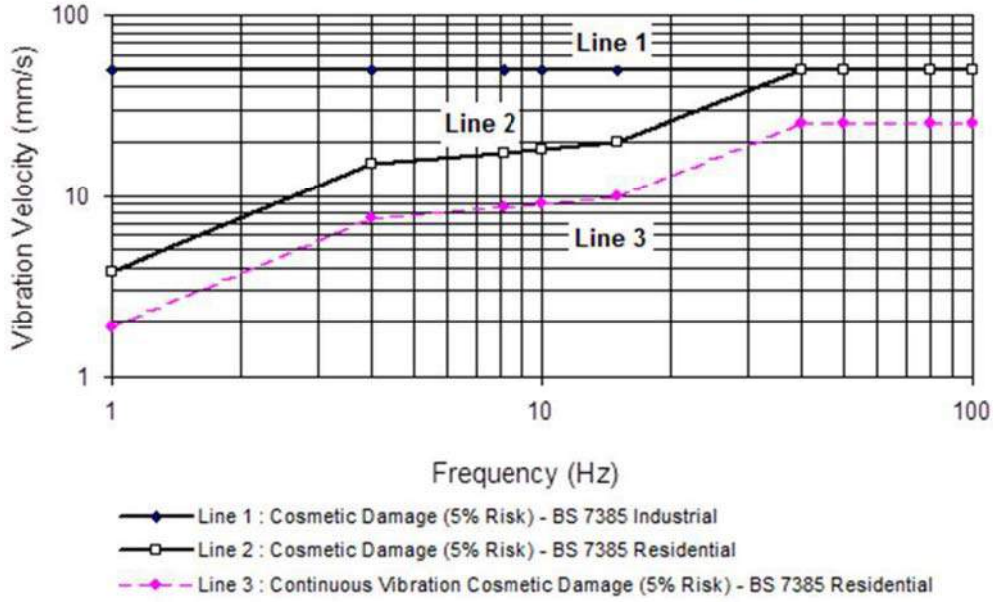
Table 2.3 Transient Vibration Guide Values - Minimal Risk of Cosmetic Damage

Line	Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structures residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

In relation to guide values for continuous vibration relating to cosmetic damage, the standard states that the guide values in **Table 2.5** relate predominantly to transient vibration, which does not give rise the resonant responses in structures, and to low-rise buildings.

Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, especially at lower frequencies where lower guide values apply, then the guide values in **Table 2.5** may need to be reduced by up to 50%, as is the case with continuous vibration from rock breaking.

Figure 2.4 Graph of Transient Vibration Guide Values for Cosmetic Damage



The standard goes on to state that minor damage is possible at vibration magnitudes, which are greater than twice those given in **Table 2.3**, and major damage to a building structure may occur at values greater than four times the tabulated values.

It is noteworthy that in addition to the guideline values presented in **Table 2.3**, the standard also states the following:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

"Some data suggests that the probability of damage tends towards zero at 12.5 mm/s peak component particle velocity. This is not inconsistent with an extensive review of the case history information available in the UK."

Note is made that **cosmetic damage** to buildings occurs at vibration levels significantly lower than those causing **structural damage**.

- British Standard 7385 indicates a 5% risk of **cosmetic damage** to commercial/industrial buildings at 50 mm/s from transient vibration and at 25 mm/s from continuous vibration; and

- British Standard 7385 indicates a 5% risk of **cosmetic damage** to residential and light framed structures at 15 mm/s at 4 Hz from transient vibration and at 7.5 mm/s at 4 Hz from continuous vibration.

In addition to the above standard, the German Standard DIN 4150 provides guideline values of vibration velocity for evaluating the effects of short-term vibration. Table 1 of DIN 4150 is reproduced as **Table 2.5** below.

Table 2.5 Guideline values of vibration velocity, vi, for evaluating the effects of short-term vibration

Line	Type of structure	Vibration Velocity, v_i, in mm/s			
		Foundation			Plane of floor of uppermost full storey
		At a frequency of			Frequency mixture
		Less than 10 Hz	10 to 50 Hz	50 to 100)* Hz	
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
3	Structures that, because of their particular sensitivity to vibration, do not correspond to those listed in lines 1 and 2 and are of great intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8
*) For frequencies above 100 Hz, at least the values specified in this column should be applied.					

In view of the foregoing, the following **conservative** site assessment control limits could be adopted for the purposes of monitoring and evaluating the measured vibration levels from the excavation works, should this be required:

Residential Structures Adjacent to Proposed Works:

- All buildings and structures adjacent to works – 7.5 mm/s peak component particle velocity (site control level).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3 PROCEDURES AND IMPLEMENTATION

3.1 INSTRUMENTATION & MEASUREMENT STANDARDS

All measurements were conducted in general accordance with Australian Standard 1055.1-1997, *"Acoustics - Description and Measurement of Environmental Noise Part 1: General Procedures"*. Acoustic Dynamics' sound measurements were carried out using precision sound level meters conforming to the requirements of IEC 61672-2019 *"Electroacoustics: Sound Level Meters – Part 1: Specifications"*. The survey instrumentation used during the survey is set out in **Table 3.1**.

Table 3.1 Noise Survey Instrumentation

Type	Serial Number	Instrument Description
2250	2679541	Brüel & Kjaer Modular Precision Sound Level Meter
4189	2670479	Brüel & Kjaer 12.5 mm Prepolarised Condenser Microphone
4230	1234136	Brüel & Kjaer Acoustic Calibrator

The reference sound pressure level was checked prior to and after the measurements using the acoustic calibrator and remained within acceptable limits.

The prevailing weather conditions during the measurements were generally calm and did not influence the noise measurements taken.

4 METHODOLOGY FOR EMISSION PREDICTITION AND ASSESSMENT

Acoustic Dynamics understands that the following items of noise emitting equipment and machinery are likely to be used during the excavation and construction works on site:

Demolition and Excavation (Around 5 weeks duration)

- Hammers;
- Saws;
- Grinders;
- Other hand-held tools;
- 5 Tonne Excavator, (including attachments);
- 14.5 Tonne Excavator, (including attachments); and
- Trucks (for removal of materials).

Construction (Around 40 weeks duration)

- Hammers;
- Saws;
- Grinders;
- Drills;
- Mud/cement mixers;

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Kanga hammers
- Nail guns;
- Compressors;
- Mobile cranes;
- Concrete trucks/pumps;
- Vehicle movements, including:
  - Trucks (for delivery of materials);
  - Trades; and
- Other typical building tools/equipment.

Accordingly, assessment of the operation of above items requires calculation of their noise emission levels to nearby potentially affected receiver locations.

Acoustic Dynamics has conducted operator-attended noise monitoring of similar/equivalent equipment at various other sites on numerous occasions. Based on previous operator-attended surveys of similar activities and equipment, prediction calculations have been undertaken to predict the noise impact at adjacent receiver locations, resulting from the proposed works, in accordance with the information and guidelines detailed in AS 2436 and the relevant EPA documents.

In our noise prediction calculations and modelling, the noise emission contribution from the above items of equipment has been incorporated into the prediction calculations and modelling along with various loss factors, including:

- Losses due to distance and ground topography;
- Airborne noise losses;
- Losses due to direction;
- Acoustic shielding.

5 NOISE & VIBRATION EMISSION PREDICTION AND ASSESSMENT

In this section Acoustic Dynamics provides an assessment of noise emission from proposed excavation and construction works at the subject site.

Acoustic Dynamics advises that the project is likely to be undertaken in two main stages:

- Demolition and Excavation; and
- Construction.

Acoustic Dynamics understands that demolition and excavation works would be undertaken over a period of 5 weeks. Construction works would then be undertaken and may last for a period of around 40 weeks.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5.1 NOISE EMISSION PREDICTION CALCULATIONS AND MODELLING

Acoustic Dynamics has performed prediction calculations and determined maximum L_{Aeq} noise emission levels at adjacent receiver locations, resulting from proposed excavation and construction activities, including use of the tools and equipment listed in **section 5**.

For the purpose of noise assessment, the likely maximum *"at source"* noise levels (A-weighted sound pressure levels at 1 metre) have been used as detailed below.

Demolition

- Hammers – 85 dB;
- Saws – 101 dB;
- Grinders – 80 dB
- Hand-held and electric tools – 94 dB;
- 5 Tonne excavator – 90 dB;
- 28 Tonne Excavator – 93dB; and
- Trucks (for removal of materials) – 90 dB.

Excavation

- 5 Tonne excavator – 90 dB;
- 28 Tonne Excavator – 93dB; and
- Trucks (for removal of materials) – 90 dB.

Construction

- Hammers – 85 dB;
- Saws – 101 dB;
- Grinders – 80 dB;
- Drills – 80 dB;
- Mud/cement mixers – 100 dB;
- Nail guns – 85 dB;
- Compressors – 92 dB;
- Kanga hammers – 103 dB;
- Concrete trucks/pumps – 95 dB;
- Vehicle movements including:
- Trucks (for delivery of materials) – 90 dB;
- Trades – N/A; and
- Other hand-held and electric tools – 94 dB.

The results from Acoustic Dynamics' noise prediction calculations and modelling are presented in **Table 5.1** below, and represent calculated **maximum** received noise emission levels resulting from the use/operation of the highest noise emitting items listed above.

Note should be made that the highest noise emitting items of plant and equipment are unlikely to be used for long durations.

Note should be made that the predicted noise levels presented in **Table 5.1** below, are the **maximum** predicted L_{Aeq} noise levels at the nearest boundaries of the listed properties,

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

resulting from proposed excavation and construction works at the subject site. Typically, received L_{Aeq} noise emission levels would be expected to be lower than these during the majority of the excavation and construction works. Significantly lower noise levels than those presented in the table would also be expected within (inside) the nearby dwellings.

Table 5.1 Maximum Excavation and Construction Works Noise Emission and Criteria

Receiver Location	Stage of Works	Predicted Range of L_{Aeq} Noise Levels[1] [dB]	EPA L_{Aeq} Noise Management Levels [dB]		Achieves EPA Guidelines?	
			Noise Affected	Highly Noise Affected	Noise Affected	Highly Noise Affected
Receivers across Henry Street (North)	Demolition	50 - 60	70	75	**Yes**	**Yes**
	Excavation	50 – 62			**Yes**	**Yes**
	Construction	61 – 66			**Yes**	**Yes**
Receivers across Gaymark Lane (East)	Demolition	46 – 64	70	75	**Yes**	**Yes**
	Excavation	47 – 47			**Yes**	**Yes**
	Construction	57 – 69			**Yes**	**Yes**
Receivers across Allen Lane (South)	Demolition	49 – 59	70	75	**Yes**	**Yes**
	Excavation	49 – 58			**Yes**	**Yes**
	Construction	60 – 63			**Yes**	**Yes**
Receivers across Station Street (West)	Demolition	45 – 62	70	75	**Yes**	**Yes**
	Excavation	45 – 62			**Yes**	**Yes**
	Construction	56 - 73			**No**	**Yes**

Note: 1) Calculated noise level at nearest residential boundary or nearest exposed facade.

2) Instances considered "highly noise affected" will be infrequent, and are unlikely to unreasonably disturb the adjoining properties.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5.2 NOISE EMISSION ASSESSMENT

The predicted noise emission levels presented in **Table 5.1** above indicate L_{Aeq} noise emission associated with the proposed construction works will exceed the relevant 'Noise Affected' construction noise management level of $L_{Aeq(15minute)}$ 45 dB at the nearest affected commercial receivers to the west of the site. Compliance is expected to be achieved with the relevant 'Noise Affected" construction noise management level of $L_{Aeq(15minute)}$ 45 dB at all nearest receivers at all other times.

At all neighbouring premises, the predicted L_{Aeq} noise emission associated with the proposed construction works is expected to comply with the relevant 'Highly Noise Affected' construction noise management level of $L_{Aeq(15minute)}$ 75 dB.

Although not considered acoustically significant because of the short duration and nature of construction activities, the magnitude of the predicted exceedance may lead to complaint and appropriate strategies should be developed for management of noise emission and community liaison.

To ensure that construction noise emission levels from the proposed works are kept to a minimum, Acoustic Dynamics provides recommendations for feasible and reasonable noise mitigation and management, which should be incorporated into the noise management plan for the proposed excavation and construction works.

5.3 VIBRATION EMISSION PREDICTION CALCULATIONS AND MODELLING

Acoustic Dynamics has been advised that mechanical excavation methods will be utilised, and based on this information advises that this excavation methodology is likely to result in minimal perceivable vibration levels (human comfort) at nearby/adjacent residential dwellings.

Acoustic Dynamics advises that where rock is to be removed from the site, excavation should incorporate the use of saw cuts in rock to enable smaller, rather than large, rock-breakers to be used to break the rock away from the saw cut.

Such sawing has been shown to produce significantly lower vibration levels and substantially reduce the potential for structural (or even cosmetic) damage to adjacent buildings and structures.

Acoustic Dynamics has predicted likely vibration levels at the nearest potentially affected adjacent receiver locations. Acoustic Dynamics' prediction calculation results are presented in **Table 5.2** below.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 5.2 Predicted Excavation Works Vibration Emission Levels and Criteria

Location	Receiver Location	Predicted Vibration Levels (PPV)[1]	5% Risk of Cosmetic Damage Criterion	Likely to Comply?
Across Henry Street	Commercial receivers to the North	**<2 mm/s**	7.5 mm	**Yes**
Across Gaymark Lane	Commercial receivers to the East	**<2 mm/s**		**Yes**
Across Allen Place	Commercial receivers to the South	**<2 mm/s**		**Yes**
Across Station Street	Commercial receivers to the West	**<2 mm/s**		**Yes**

Note: 1) Predicted received peak component particle velocity (PPV) at structure.

Acoustic Dynamics advises that predicted vibration emission levels, resulting from the proposed works are well below structural damage criteria presented within **Section 3.5** of this report.

6 DISCUSSION AND RECOMMENDATIONS

Further to the predicted noise emission levels presented in **Section 5**, Acoustic Dynamics advises that measures are required to minimise and manage noise emission and impact from the proposed excavation and construction works at the subject site.

Acoustic Dynamics recommends that the use of noise generating equipment during the proposed works at the subject site only be carried out during the following construction hours:

- Monday to Friday 7:00am to 5:00pm; and
- Saturday 8:00am to 1:00pm.

Acoustic Dynamics recommends the following measures be implemented to minimise and manage noise and vibration emission from the subject excavation and construction:

1. Noise & vibration induction of all site staff – including the explanation of noise and vibration control and minimisation and a discussion of project specific reduction strategies;

2. Implementation of an appropriate community liaison procedure – including a noise and vibration management and noise and vibration complaint procedure and continual liaison with nearby potentially affected receivers;

3. Implementation of a noise and vibration monitoring and reporting programme (where necessary – to protect the interest of all parties or should complaints arise);

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4. The use of temporary noise barriers around particularly noisy activities (where feasible and reasonable);

5. Use of quietest available equipment and lowest vibration generating equipment for works (where feasible and reasonable);

6. Where excavation of rock is required, an appropriate excavation methodology should be adopted:

    - Use of saw cuts in rock around the external perimeter of any excavation works, and wherever feasible, to enable smaller rock-breaker to be used to remove the remaining rock;
    - Use of hand held jackhammers for rock-breaking activities within 5m of adjacent structures;
        i. No use of small rock-breakers within 5m of adjacent structures;
        ii. No use of large rock-breakers within 10m of adjacent structures;
    - Vibration monitoring during periods of intensive excavation works, where adverse comment is generated or possible;

7. Where there is any risk of damage, a dilapidation survey of adjacent buildings and structures should be completed prior to the commencement of any excavation works;

8. Implementation of periods of respite, where highly intensive activities produce loud noise (i.e. greater than 75 dB(A) at nearby residences) to minimise disturbance on nearby receivers; and

9. Should trucks or other vehicles be required to be on site for longer than five minutes, Acoustic Dynamics advises that engines should be switched off for the duration.

The following sections provide detail about the various measures listed above and how they are to be incorporated into the noise management procedures for the proposed works.

6.1 NOISE AND VIBRATION INDUCTION OF ALL SITE STAFF

Acoustic Dynamics recommends all site staff be inducted, ensuring each person is aware of the noise and vibration management and mitigation procedures applicable to the site and subject site works.

6.2 IMPLEMENTATION OF COMMUNITY LIASON PROCEDURE

Acoustic Dynamics recommends implementation of an appropriate community liaison procedure, including a noise management and compliant procedure, and continual liaison with the nearby potentially affected receivers. The following should be carried out by the proponent:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- A sign is to be located near the entry to the site with 24 hour contact details (mobile phone numbers and email addresses for receipt of complaints);
- A detailed (physical) log of all complaints relating to noise is to be kept on site. Such a log should including details of:
  i. the address of the complainant;
  ii. the date and time of the complaint;
  iii. the date and time the subject noise was heard;
  iv. a description of the activities being undertaken at the time of the subject complain;
  v. a contact telephone number for the complainant; and
  vi. detail of the person who fielded and logged the complaint;
  vii. the signature of the project manager or site foreman confirming the complaint has reached an appropriate level of responsibility;
  viii. detail of the action taken to respond to the complaint and the timing of this response; and
  ix. the signature of the project manager or site foreman signing off confirmation that the complaint has been appropriately addressed.

NB: Note is made that should the complaint require the services of an independent consultant to investigate or conduct measurements, such services shall be engaged promptly and dates and times of contact with such a consultant shall be maintained/detailed within the complaints log.

6.3 USE OF TEMPORARY NOISE BARRIERS

Where feasible and reasonable, Acoustic Dynamics recommends the use of temporary noise barriers around (or along) the boundaries of the site to assist with reducing noise emission during high noise generating activities to the pedestrian paths surrounding the site. A suitable, temporary noise barrier is likely to:

- Contain **no gaps** along the surface area of the screen, and be **close fitting (ie within 30mm) to the ground** (to prevent the transmission of noise below the barrier); and

- The temporary noise barrier(s) should provide a minimum surface density of **14 kg/m^2**, and contain **no gaps** along the surface of the barrier(s).
  i. 25mm thick marine plywood; or
  ii. A minimum 9mm thick compressed fibros-cement sheeting; or
  iii. Other suitable material (minimum surface density of **14 kg/m^2**); and

- Design of supports of any temporary noise barrier(s) must be verified by a suitably qualified person to ensure sufficient structural and wind loading support is provided.

6.4 USE OF QUIETEST AVAILABLE EQUIPMENT FOR WORKS

Acoustic Dynamics recommends that plant and equipment used during the proposed works be selected to ensure that the quietest available equipment will be used.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

As indicated within **Section 6.3**, Acoustic Dynamics will carry out operator-attended noise measurements of site equipment and operations (as required/requested), to ensure quietest techniques and equipment are being used for the subject works.

6.5 IMPLEMENTATION OF A NOISE & VIBRATION MONITORING AND REPORTING PROGRAMME

Noise & Vibration monitoring during works will need to be incorporated, where appropriate, to monitor and quantify received noise and vibration levels at adjacent buildings and structures.

An appropriate noise and vibration monitoring methodology incorporating operator-attended and/or unattended monitoring could be determined following operator-attended test measurements during initial works.

6.6 AN APPROPRIATE EXCAVATION METHODOLOGY

Where excavation of rock is required, the excavation methodology should incorporate the use of saw cuts in the rock wherever feasible to enable smaller rock-breakers to be used to remove the rock. Such sawing has been shown to produce significantly lower vibration levels and substantially reduce the potential for structural (or even cosmetic) damage to adjacent buildings and structures.

In addition, Acoustic Dynamics recommends the following:

- Use of hand-held jackhammers for rock-breaking activities **within 5m** of adjacent structures;
- No use of small rock-breakers **within 5m** of adjacent structures; and
- No use of large rock-breakers **within 10m** of adjacent structures.

6.7 PREPARATION OF A DILAPIDATION SURVEY OF ADJACENT BUILDINGS AND STRUCTURES

Where there is any risk of damage, a detailed dilapidation survey of adjacent buildings and structures completed prior to the commencement of any excavation works would provide an appropriate reference condition, against which post works inspections can be compared.

6.8 PROVISION OF RESPITE PERIODS DURING INTENSIVE ACTIVITIES

Where there is potential for receivers to be affected by sustained high noise levels (i.e. greater than $L_{Aeq(15minute)}$ 75 dB at nearby residences), periods of respite are to be provided. Such respite may include provisions:

1. Not to commence such noisy activities prior to 8:00am;
2. Not to undertake such noisy activities after 5:00pm; and
3. Not to undertake such noisy activities for any sustained period greater than 3 hours without a minimum 30 minute period of respite.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7 CONCLUSION

Acoustic Dynamics has undertaken a quantitative assessment of the noise impact at the nearest potentially affected receivers resulting from the demolition, excavation and construction works and associated activities, for the proposed works at the southeast corner of Henry Street and Station Street, Penrith, in accordance with the requirements of Penrith City Council, the NSW EPA's guidelines and relevant Australian Standards.

The magnitude of the predicted noise exceedances above the construction noise goals (determined in accordance with the EPA's ICNG) may lead to complaint (adverse comment) and appropriate strategies should be developed for management of noise emission and community liaison.

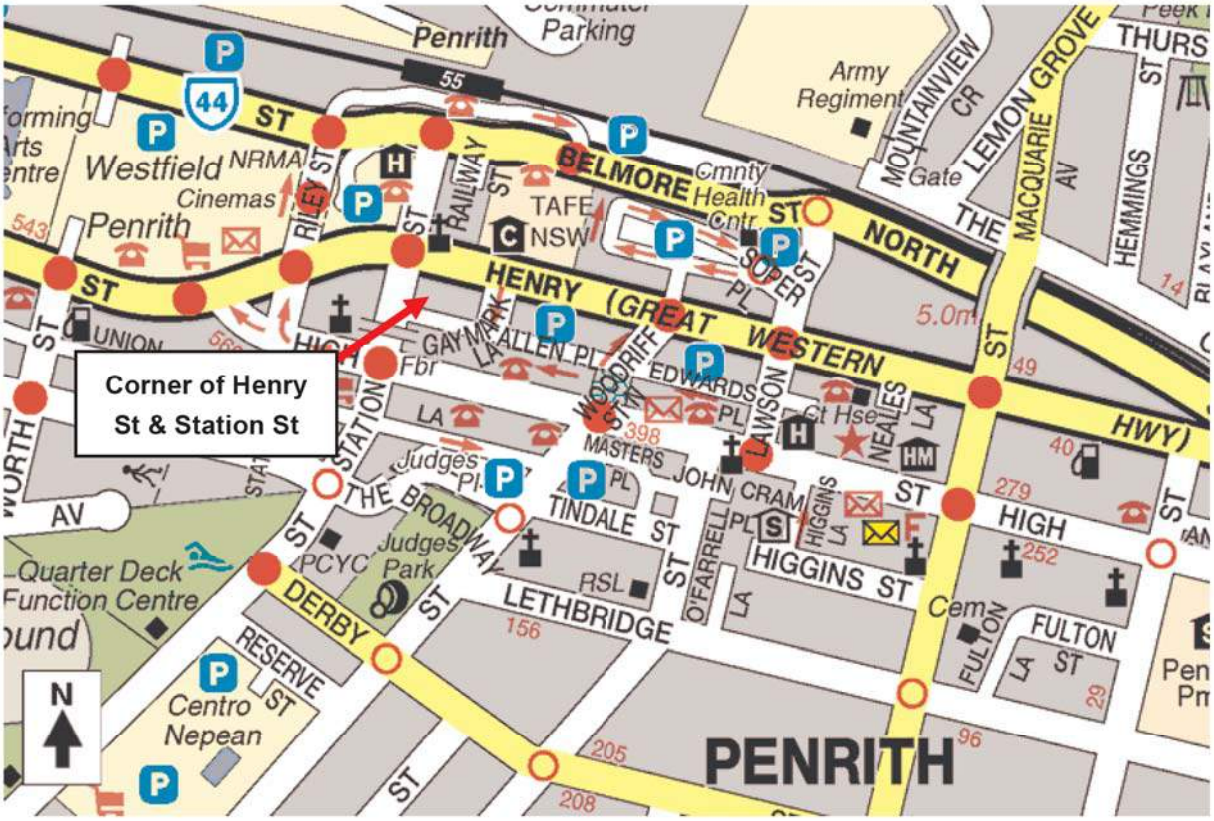
Acoustic Dynamics advises that implementation of the recommendations contained in **Section 6** of this report will assist with the mitigation and management of noise emission from excavation and construction activities at the subject development site.

Should further information be required relating to this report please contact Acoustic Dynamics on 02 9908 1270.

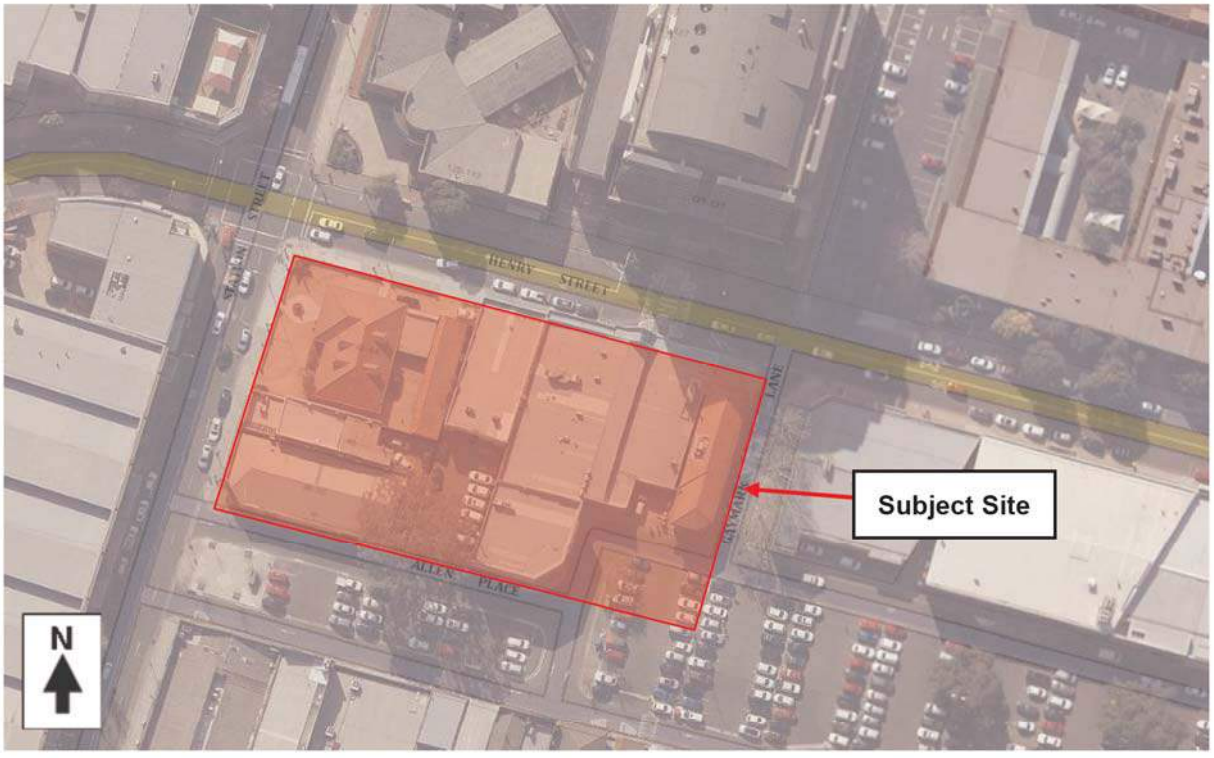
Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

APPENDIX A – LOCATION MAP, AERIAL PHOTO & SITE PLAN

A.1 LOCATION MAP



A.2 AERIAL PHOTO



Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

A.3 SITE PLAN

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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A	Matt Parkinson	Chris Bielby			14/12/2020

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City Park Penrith

Non-Aboriginal Heritage Impact Statement (HIS)

Report to JMD Design on behalf Penrith City Council

January 2021

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Document Set ID: 954[illegible]
Version: 1, Version Date: [illegible]

Document history and status

Revision	Date issued	Reviewed by	Approved by	Date approved	Review type	Revision type
1	19 January 2021	Adele Zubrzycka and Josh Symons	Josh Symons	19 January 2021	Internal	Draft 1
2	20 January 2021	JMD Design			Client	Draft 1
3	22 January 2021	Josh Symons	Josh Symons	22 January 2021	Final draft	Final draft
4	25 January 2021	JMD Design			Client	Final draft
5	27 January 2021	Josh Symons	Josh Symons	27 January 2021	Final	Final

Printed:	
Last saved:	27 January 2021
File name:	20017 Penrith City Park Aboriginal and Non-Aboriginal heritage assessment
Author:	Darrienne Wyndham, Olivia Turner, Jessica Horton
Project manager:	Jenny Winnett
Name of organisation:	Artefact Heritage Services Pty Ltd
Name of project:	Penrith City Park
Name of document:	Penrith City Park
Document version:	Final

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

EXECUTIVE SUMMARY

Penrith City Council (Council) has proposed to establish a City Park at the corner of Station Street and Henry Street, Penrith (the proposal).

In July 2020, Artefact Heritage prepared a preliminary heritage assessment report outlining Aboriginal and non-Aboriginal archaeological potential and identifying the built heritage and heritage-listed items of the study area. The report also included brief identification of heritage constraints and opportunities as relevant to the project.

Artefact Heritage has been engaged by JMD Design on behalf of Council to provide a Heritage Impact Statement (HIS) for the proposal addressing non-Aboriginal heritage values within the study area. The aim of this HIS is to identify listed and non-listed heritage items and archaeological remains which may be impacted by the proposal; determine the level of heritage significance of each item; assess the potential impacts to those items; recommend mitigation measures to reduce the level of heritage impact and identify other management or statutory obligations.

Overview of findings

This HIS has made the following conclusions:

- There are three listed heritage items in the vicinity of the proposed works:
  - Penrith Council Chambers (former) (Penrith Local Environmental Plan [LEP] 2010 Item No. 189)
  - TAFE Building (Penrith LEP 2010 Item No. 689)
  - Prospect Electricity Building (former) (Penrith LEP 2010 Item No. 701)
- There is one unlisted potential heritage item in the vicinity of the proposed works:
  - John Price & Son Funeral Home (former) assessed as of local significance
- The study area has been assessed as having nil potential to contain locally significant archaeological remains dating to the first European occupation phase of the site (1789 – c1850s), low potential to contain archaeological remains of local significance relating to the mid-late nineteenth century commercial development and occupation of the site (Phase 2: c1850s - c1900) and moderate potential to contain archaeological remains of local significance relating to the early twentieth century commercial development and occupation of the site (Phase 3: c1900-1950). There is potential that these remains would be considered 'relics' under the *NSW Heritage Act 1977.*
- The proposal has been assessed as having a:
  - Neutral direct (physical) impact to the Penrith Council Chambers (former) heritage item
  - Minor indirect (visual) impact to the Penrith Council Chambers (former) heritage item
  - Neutral direct (physical) impact to the TAFE Building heritage item
  - Minor indirect (visual) impact to the TAFE Building heritage item
  - Neutral direct (physical) impact to the Prospect Electricity Building (former) heritage item

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Minor indirect (visual) impact to the Prospect Electricity Building (former) heritage item
- Major direct (physical) impact (demolition) to the John Price & Son Funeral Home unlisted heritage item
- Major visual impact (demolition) to the John Price & Son Funeral Home potential heritage item
- Potential impact to areas assessed as demonstrating potential for archaeological remains.

Recommendations

The following recommendations would be considered during further development of the proposal design:

General

- Comprehensive photographic archival recording of the interiors and exteriors of the John Price & Son funeral home in accordance with relevant Heritage Division's guidelines should be conducted prior to demolition of the building. The photographic archival recording of each item would be carried out prior to works commencing, and in some cases, during the construction program. It should be prepared in accordance with the NSW Heritage Office's *How to Prepare Archival Records of Heritage Items* (1998), and *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006) by a suitably qualified heritage consultant using archival-quality material.
- A 3D scan or photogrammetry of the John Price & Son funeral home should be considered in addition to the photographic archival recording.
- The ornamental octagonal fountain from the John Price & Son funeral home will be retained *in situ* and protected during works, and form part of the park landscaping following the completion of works.
- The stained glass windows and Chromatex bricks from the John Price & Son funeral home should be salvaged during demolition works.
- Where feasible, the Chromatex bricks from the John Price & Son funeral home should be reused in the park landscaping following the completion of works. If any damage is sustained by the octagonal fountain during works, these bricks may be suitable as replacements.
- A salvage methodology would be prepared for the octagonal fountain, Chromatex bricks and stained glass windows of the John Price & Son funeral home, detailing the specific recommendations for the safety of the items during the demolition process and possible next steps e.g., donation to local historical societies. Structural engineers would be consulted as part of this preparation.
- Opportunities for providing historical interpretive displays in the proposal design would be explored.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- All relevant staff, contractors and subcontractors should be made aware of their statutory obligations for heritage under *NSW National Parks and Wildlife Act 1974* and *NSW Heritage Act 1977*. This may be implemented as a heritage induction.

Archaeology

- As the potential for historical relics has been identified within the study area and the detailed design is currently unknown, archaeological testing under a Section 139 (s139) (1B) Exception permit is recommended. This would inform future designs for the proposal and involve:
  - A s139 (1B) exception permit application would be prepared and submitted to Heritage NSW, DPC for approval prior to works commencing
  - The s139 (1B) application will require the preparation of an archaeological research design (ARD), with an archaeological excavation methodology, which would be submitted in support of the permit application. The ARD should include additional primary research where required to inform the excavation methodology, and an impact assessment once the demolition methodology has been prepared by the demolition contractor
  - A program of archaeological test excavation and monitoring would be undertaken in accordance with the s139 conditions and ARD in areas assessed as containing potential for locally significant archaeological remains
  - Results derived from archaeological test excavations would be used to inform future detailed designs for the project including areas that should be avoided by subsurface impacts where feasible.
- If archaeological remains are found during testing and impacts cannot be avoided, a Section 140 Excavation permit would be required from Heritage NSW:
  - A s140 excavation permit application would be prepared and submitted to Heritage NSW, DPC for approval prior to works commencing
  - This would require the preparation of an archaeological research design (ARD), with a historical archaeological excavation methodology, which would be submitted in support of the permit application
  - A program of archaeological salvage excavation would be undertaken in accordance with the s140 conditions and ARD.
- An Unexpected Finds Procedure would be prepared as part of the archaeological investigations. The NSW Heritage Division would be notified of the discovery of a relic in accordance with Section 146 of the NSW Heritage Act 1977.

Vibration impacts

- During construction and demolition works, monitoring of vibration impacts to the locally significant former Council Chambers (Penrith LEP 2010 Item No. 189), TAFE Building (Penrith LEP 2010 Item No. 689) and former Prospect Electricity Building (Penrith LEP 2010 Item No.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

701) would be undertaken by structural engineers or a vibration specialist. Assessment and monitoring of vibration impacts would adhere to the:

  - British Standard BS 7385: *Part 2: Evaluation and Measurement for Vibrations in Buildings – Part 2 Guide to Damage Levels from Ground-Borne Vibration*
  - German Standard DIN 4150 *Part 3: Structural Vibration in Buildings: Effects on Structures.*

- If vibration monitors are necessary for listed heritage items, non-invasive adhesive methods such as beeswax would be considered.
- If it is identified that levels of vibration would result in damage to heritage fabric associated with the listed heritage items, works must cease and the construction methodology be reviewed by project engineers in consultation with a heritage consultant to mitigate further impacts.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

CONTENTS

1.0 Introduction 15
1.1 Background 15
1.2 Study area 15
1.3 Proposal 15
1.4 Design stage 16
1.5 Report structure 16
1.6 Limitations and constraints 16
1.7 Authorship 17
2.0 Methodology 19
2.1 Identification of heritage listed items 19
2.2 Identification of unlisted potential heritage items 19
2.3 Assessment of archaeological potential 19
2.3.1 NSW Heritage assessment guidelines 20
2.3.2 Archaeological research potential 21
2.4 Assessment of heritage impact 22
3.0 Heritage Management Framework 23
3.1 Introduction 23
3.2 Environmental Protection and Biodiversity Conservation Act 1999 23
3.2.1 Commonwealth Heritage List 23
3.2.2 National Heritage List 24
3.3 NSW Heritage Act 1977 24
3.3.1 State Heritage Register 24
3.3.2 Section 170 registers 24
3.3.3 Relics provisions 24
3.3.4 Works 26
3.4 Environmental Planning and Assessment Act 1979 26
3.4.1 Penrith Local Environmental Plan 2010 26
3.4.2 Penrith Development Control Plan 2014 27
3.5 Non-statutory registers 27
3.5.1 Register of the National Estate 27
3.5.2 Register of the National Trust 27
3.6 Unlisted potential heritage items 28
3.6.1 Summary of heritage listings 28
4.0 Historical Context 30
4.1 Aboriginal history 30
4.2 Early development of Penrith 31

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4.3 Development of the study area 34
4.3.1 John Price & Son Funeral Home 41
5.0 Site Inspection 45
5.1 Introduction 45
5.2 Description 45
5.3 John Price & Son Funeral Home 45
5.4 Images 46
6.0 Archaeological Assessment 49
6.1 Known land use 49
6.1.1 Phase 1: Early Land Grants (1789 – c1850) 49
6.1.2 Phase 2: Nineteenth Century Commercial Development (c1850-c1899) 49
6.1.3 Phase 3: Early Twentieth Century Commercial Development (c1900 – c.1950) 50
6.1.4 Phase 4: Post-War Demolitions and Redevelopment (c1950-present) 50
6.2 Known disturbance 53
6.3 Assessment of archaeological potential 53
6.3.1 Phase 1: Early Land Grants (1789 – c1850) 53
6.3.2 Phase 2: Nineteenth Century Commercial Development (c1850 – c1900) 53
6.3.3 Phase 3: Early Twentieth Century Commercial Development (c1900 – c1950) 54
6.3.4 Phase 4: Post-War Demolitions and Redevelopment (c1950-present) 54
6.4 Assessment of archaeological significance 55
6.5 Statement of archaeological significance 57
6.6 Summary of archaeological potential and significance 57
7.0 Built Heritage Assessment 61
7.1 Assessment of significance 61
7.1.1 Penrith Council Chambers (former) (Penrith LEP 2010 Item No. 189) 61
7.1.2 TAFE Building (Penrith LEP 2010 Item No. 689) 62
7.1.3 Prospect Electricity Building (former) (Penrith LEP 2010 Item No. 701) 63
7.1.4 John Price & Son Funeral Home (former) (unlisted potential heritage item) 64
8.0 Impact Assessment 76
8.1 Introduction 76
8.2 Proposal 76
8.3 Design development 77
8.4 Project justification 77
8.5 Assessment of heritage impact 80
8.5.1 Impact on listed items 80
8.5.2 Impact on unlisted potential heritage item 80
8.6 Archaeological impact assessment 81
8.6.1 Penrith Development Control Plan 2014 81

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.7 Statement of heritage impact 84
9.0 Conclusions and Recommendations 86
9.1 Conclusions 86
9.2 Recommendations 87
10.0 References 90

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

FIGURES

Figure 1: Location of study area 18

Figure 2: Heritage items overview map 29

Figure 3: c1820s Castlereagh Parish map showing the study area within Captain Daniel Woodriffe's 1000-acre grant (Source: Land Registry Services) 32

Figure 4: Undated Mulgoa Parish map showing the study area within Captain Daniel Woodriffe's 1000-acre grant (Source: Land Registry Services) 33

Figure 5: 1883 Castlereagh Parish map showing railway line through Captain Daniel Woodriffe's 1000-acre grant (Source: Land Registry Services) 33

Figure 6: Penrith subdivision plan, c1880s (Source: State Library NSW). Shops can be seen along Henry Street within the study area, while established structures labelled 'store' and 'shop' can be seen south of the study area along High Street. It is likely that outbuildings for the High Street businesses would have been present by this time. 36

Figure 7: View east along High Street from the Station Street intersection showing the nature of structures to the south of the study area (Source: Penrith City Council) 37

Figure 8: View east along High Street at the Station Street intersection, c1919. These commercial premises for the States Boot Manufacturing Company was located to the south of the study area, though outbuildings from this shop extended into the study area (Source: Penrith City Council) 37

Figure 9: c1940s aerial imagery showing development within the study area (Source: SixMaps) 38

Figure 10: Shop fronts along High Street, 1946, to the south of the study area (Source: Penrith City Council) 38

Figure 11: Rear of a home along Henry Street (Source: Penrith City Library). This image provides an indication into the types of outbuildings that would have been present within the study area. 39

Figure 12: c1980s aerial imagery of Penrith, looking east (Source: Penrith City Council). Study area outlined in red. 39

Figure 13: 1990 aerial imagery showing multi-storey carpark within study area (Source: Penrith City Council) 40

Figure 14: 1994 photograph showing Station Street and High Street intersection (Source: Penrith City Council). Showing existing development to the south of the study area. 40

Figure 15: 2001 image showing Station Street and High Street intersection and existing development to the south of the study area (Source: Penrith City Council). Access bridge to multi-storey carpark can be seen in the background, present-day development seen within foreground. 41

Figure 16: 2007 aerial imagery showing multi-storey carpark along Allen Lane within the study area (Source: Google Earth) 41

Figure 17. Advertisement for new location of John Price & Son funeral home, December 2, 1954. (Source: The Nepean Times via National Library of Australia) 43

Figure 18: John Price & Son funeral home, 1957. (Source: Blue Mountains Gazette.) 43

Figure 19. Aerial photograph of John Price & Son building from Station Street, showing the layout of the funeral home. (Source: Penrith City Library) 44

Figure 20: View southwest along Gaymark Lane showing commercial development within the study area 46

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figure 21: View southwest from Gaymark Lane showing commercial development and carparking facilities within the study area 46

Figure 22: View northwest showing commercial development and carparking facilities within the study area 46

Figure 23: View southwest showing carparking facilities within the study area and surrounding commercial development 46

Figure 24: View northwest along Allen Place showing commercial development and carparking facilities within study area 47

Figure 25: View north within study area from Allen Place showing rear of commercial developments and carparking facilities 47

Figure 26: View northwest from the study area along Allen Place showing commercial development and multistorey carparking facilities 47

Figure 27: View northeast from Station Street showing commerical development at the junction with Allen Place within the study area 47

Figure 28: View east from Station Street showing commercial development and funeral home (left) within study area 47

Figure 29: View east from Station Street towards Henry Street showing funeral home (right) and former Council Chambers (left) 47

Figure 30: View southwest from Henry Street towards study area showing funeral home (right) and commercial development (left) 47

Figure 31: View south from Henry Street towards study area showing commercial development 47

Figure 32. View north-east from Henry Street towards former Council Chambers building (left) and modern development (right) 48

Figure 33. View north from former John Price & Son funeral home towards former Council Chambers building 48

Figure 34. View south from former Council Chambers building towards the study area and John Price & Son funeral home 48

Figure 35. View west from former John Price & Son funeral home towards the former Prospect Electricity building 48

Figure 36. View east from the former Prospect Electricity building towards the study area 48

Figure 37. View north-east from Henry Street within study area towards the TAFE Building heritage item 48

Figure 38. View south-west from the TAFE Building heritage item towards the John Price & Son funeral home within the study area 48

Figure 39. View south-east from the TAFE Building heritage item towards the study area 48

Figure 40. Known historical structures from Phases 2 and 3, using information taken from the 1888 subdivision plan and 1943 aerial of the study area. The Phase 2 outbuildings are undocumented; thus, the approximate area of these outbuildings is also included. 52

Figure 41. Phase 2 archaeological potential for the study area 60

Figure 42. View of Station Street elevation of the former John Price & Son funeral home. (Source: Google Maps) 65

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figure 43. View of the Henry Street elevation of the former John Price & Son funeral home. (Source: Google Maps) 65

Figure 44. View of the octagonal brick fountain in the Station Street courtyard of the former Price & Son funeral home. (Source: JMD Design)..... 65

Figure 45. Current design plans for the proposal. (Source: JMD Design) 78

Figure 46. Supplied by JMD Design – Artists Impression of City Park in Spring, trees 6 months after installation..... 79

Figure 47. Supplied by JMD Design – Artists impression of Penrith City Park in Spring, trees at 15-20 year maturity..... 79

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

TABLES

Table 1: Grades of archaeological potential 20
Table 2: NSW heritage assessment criteria 21
Table 3: Terminology for assessing the magnitude of heritage impact. 22
Table 4: Summary of listings for heritage items in and near the study area. 28
Table 5. Assessment of archaeological significance against the NSW Heritage assessment criteria. 55
Table 6: Overview of archaeological potential and significance 58
Table 7. Assessment of significance against the NSW Heritage assessment criteria 61
Table 8. Assessment of significance against the NSW Heritage assessment criteria 62
Table 9. Assessment of significance against the NSW Heritage assessment criteria 63
Table 10: Significance assessment for 'John Price & Son funeral home (former)' 66
Table 11. Standard grades of significance. 67
Table 12: Heritage significant fabric at former John Price & Son funeral home - Exterior 68
Table 13: Significant fabric located at former John Price & Son funeral home - Interior 73
Table 14: Penrith DCP 2014 controls 81
Table 15. Statement of Heritage Impact for the proposed works for the Penrith City Park project 84

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

ABBREVIATIONS AND GLOSSARY

Acronym	Description
Archaeological remains	Relics or work of local or state significance
CHL	Commonwealth Heritage List
DCP	Development Control Plan
EIS	Environmental Impact Statement
EP&A Act	*Environmental Planning and Assessment Act* 1979
EPBC Act	*Environment Protection and Biodiversity Conservation Act* 1999
HCA	Heritage Conservation Area
Heritage NSW, DPC	Heritage NSW, Department of Premier and Cabinet
HIS	Heritage Impact Statement
ICOMOS	International Council on Monuments and Sites
LEP	Local Environmental Plan
LGA	Local Government Area
NHL	National Heritage List
NSW	New South Wales
OEH	Office of Environment and Heritage
Relic	Any deposit, artefact, object or material evidence that relates to the settlement of the area that comprised New South Wales, not being Aboriginal settlement, and is of State or local significance
SHI	State Heritage Inventory
SHR	State Heritage Register
UNESCO	United Nations Educational, Scientific and Cultural Organisation
Works	Evidence of significant infrastructure that may be buried and archaeological in nature
WHL	World Heritage List

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1.0 INTRODUCTION

1.1 Background

Penrith City Council (Council) has proposed to establish a City Park at the corner of Station Street and Henry Street, Penrith (the proposal). The City Park will be a vibrant green space that is a destination for residents, workers and visitors and a stimulant for the day- and night-time economy of the area.

In July 2020, Artefact Heritage prepared a preliminary heritage assessment report outlining Aboriginal and non-Aboriginal archaeological potential and identifying the built heritage and heritage-listed items of the study area. The report also included brief identification of heritage constraints and opportunities as relevant to the project. Artefact Heritage has been engaged by JMD Design on behalf of Council to provide a HIS for the proposal addressing non-Aboriginal (historic) heritage values within the study area.

The aim of this HIS is to identify listed and non-listed heritage items and archaeological remains which may be impacted by the proposal; determine the level of heritage significance of each item; assess the potential impacts to those items; recommend mitigation measures to reduce the level of heritage impact and identify other management or statutory obligations.

1.2 Study area

The study area is located at the corner of Station and Henry Streets, Penrith, within the City of Penrith Local Government Area (LGA), approximately 55 kilometres (km) west of the Sydney Central Business District (Figure 1). The study area comprises a 0.87 hectare portion of land currently occupied by car parking and twentieth century commercial development. The lots included within the study area comprise Lot 3 DP 1200790, Lot 1 DP 526304, Lot E DP 163176, Lot 2 DP 556075, Lot 10 DP 5536655, Lot 11 DP 5536655, Lot 1 DP 164798, Lot 1 DP 252457 and Lot 1 DP 254763.

The proposed site of the City Park (the study area) is shown in Figure 1.

1.3 Proposal

Council has proposed to create a City Park in the study area (Figure **1**). The proposal would involve the demolition of all existing structures within the study area and remediation of the site.

Key features of the proposal are to provide:

- An irrigated central lawn
- Super advanced trees and mass planting
- Recycled brick paving
- Custom designed amenities building with storage
- Public art
- Sustainable water feature (or water features) with interactive elements
- Quality and durable fixtures, fittings, and furniture (i.e., seating, bubblers, display banner poles, lighting)
- Sustainability and smart park elements (technology / smart city innovation)
- Waste innovation (for properties adjacent to the park)
- Signage distinct to Penrith

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Performance space 'Urban canopy / built and natural shade'
- WSUD, upgrade kerb and gutters
- Construct and re-surfacing the impacted road pavement.

1.4 Design stage

The current design will be submitted to Council with a Development Application (DA) for the proposed City Park.

The design process has included the following consultation:

1. Community Consultation in December 2019 to inform on how people would like to use the park, and what features should be included (by Penrith City Council)
2. Consultation with Businesses and property owners in August 2020 to inform on the Concept design and confirm operational requirements for Businesses (by JOC consulting)
3. Community Consultation in November 2020 to seek feed-back on the preliminary DA Plans (by Penrith City Council)

1.5 Report structure

The structure and content of this report is as follows:

- **Chapter 1** (this chapter) – Project background and description
- **Chapter 2** – An overview of report methodology
- **Chapter 3** – The heritage management framework including the legislative and policy context, and relevant criteria applicable to the proposal
- **Chapter 4** – An overview of the historical context of the study area
- **Chapter 5** – A description of the site and findings from the site inspection
- **Chapter 6** – An assessment of archaeological potential and significance within the study area
- **Chapter 7** – An assessment of significance of heritage items within the study area
- **Chapter 8** – An overview of impacts to heritage items and archaeology arising from the proposal
- **Chapter 9** – Conclusions and recommended measures to mitigate and manage potential impacts
- **Chapter 10** – References of sources used in the preparation of this report.

1.6 Limitations and constraints

This report has been informed by the previous draft Aboriginal and Non-Aboriginal Heritage Assessment of the study area prepared by Artefact Heritage (2020). The HIS builds upon the information within the preliminary report, with additional research and an additional site visit undertaken. This assessment has included a search of S170 items listed in the NSW State Heritage Inventory (SHI) only.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

1.7 Authorship

This report was prepared by Darrienne Wyndham (Heritage Consultant, Artefact Heritage), Olivia Turner (Heritage Consultant, Artefact Heritage) and Jessica Horton (Heritage Consultant, Artefact Heritage).

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

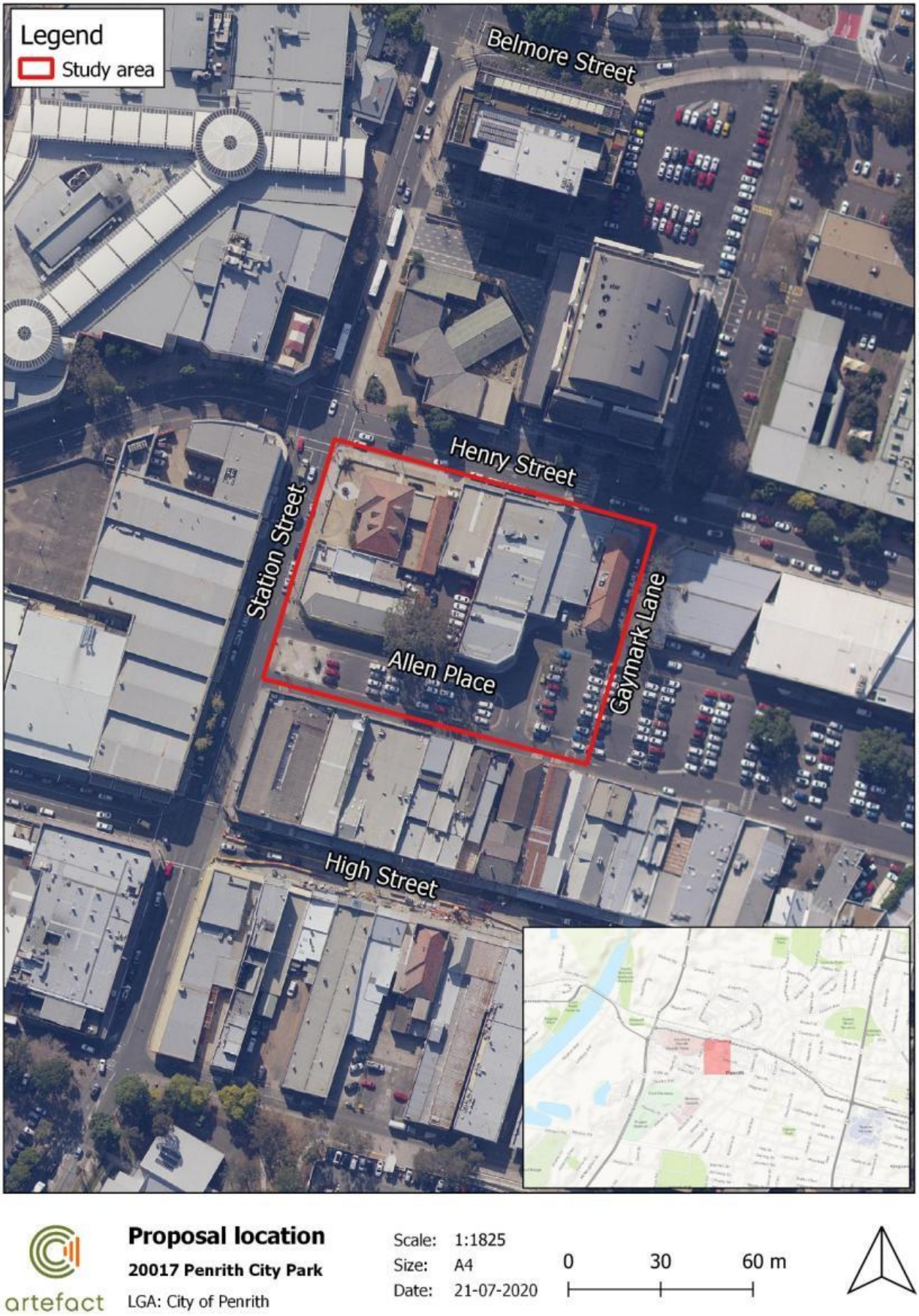

Figure 1: Location of study area

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2.0 METHODOLOGY

2.1 Identification of heritage listed items

Heritage listed items within and within 50 metres (m) of the study area were identified through a search of relevant state and federal statutory and non-statutory heritage registers:

- World Heritage List
- Commonwealth Heritage List
- National Heritage List
- State Heritage Register
- Penrith Local Environmental Plan (LEP) 2010
- Section 170 Heritage and Conservation Registers
- NSW State Heritage Inventory database.

Items listed on these registers have been previously assessed against the NSW Heritage Assessment guidelines (as outlined in Section 2.3.1). Statements of heritage significance, based on the NSW Heritage Assessment guidelines, as they appear in relevant heritage inventory sheets and documents, are provided in this assessment.

Where relevant Conservation Management Plans (CMPs) and other heritage management documents and guidelines have been utilised to provide additional information regarding heritage significance. Where used, these have been cited.

2.2 Identification of unlisted potential heritage items

During the preparation of the initial Aboriginal and Non-Aboriginal Heritage Assessment for the proposal, an unlisted structure with potential for heritage significance was identified by Artefact Heritage. This HIS provides an outline of the history of this structure, a local funeral home (c1954), and assesses the heritage significance of the potential heritage item against the NSW Heritage Assessment Criteria (see Section 7.1.4).

2.3 Assessment of archaeological potential

Historical archaeological potential is defined as the potential of a site to contain historical archaeological relics, as classified under the NSW *Heritage Act 1977*. 'Archaeological potential' refers to the likelihood that an area contains physical remains associated with an earlier phase of occupation, activity or development of that area. This is distinct from 'archaeological significance' and 'archaeological research potential'. These designations refer to the cultural value of potential archaeological remains and are the primary basis of the recommended management actions included in this document.

The assessment of historical archaeological potential is based on the identification of former land uses and evaluating whether subsequent actions (either natural or human) may have impacted on archaeological evidence for these former land uses. Knowledge of previous archaeological investigations, understanding of the types of archaeological remains likely to be associated with various land uses, and the results of site inspection are also taken into consideration when evaluating the potential of an area to contain archaeological remains.

Assessments of significance are preliminary in nature and, where possible, significance has been assessed against the NSW Heritage Assessment Criteria. The assessment is informed by the NSW

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Heritage Division's 2009 guidelines *Assessing Significance for Historical Archaeological Sites and Relics.*

The following grading of archaeological potential has guided the assessment of archaeological potential in this report.

Table 1: Grades of archaeological potential

Grading	Justification
Nil	No evidence of historical development or use, or where previous impacts such as deep basement structures would have removed all archaeological potential.
Nil to Low Potential	Where there has only been low intensity historical activity, such as land clearance or informal land use, with little to no archaeological 'signature' expected; or where previous impacts were extensive, such as large-scale bulk excavation which would leave isolated and highly fragmented deposits.
Low	Research indicates little or low intensity historical development, or where there have been substantial previous impacts, disturbance and truncation in locations where some archaeological remains such as deep subsurface features may survive.
Moderate	Analysis demonstrates known historical development and some previous impacts, but it is likely that archaeological remains survive with some localised truncation and disturbance.
High	Evidence of multiple phases of historical development and structures with minimal or localised twentieth century development impacts, and it is likely the archaeological resource would be largely intact.

2.3.1 NSW Heritage assessment guidelines

Determining the significance of heritage items or a potential archaeological resource is undertaken by utilising a system of assessment centred on the *Burra Charter* of Australia ICOMOS. The principles of the charter are relevant to the assessment, conservation and management of sites and relics. The assessment of heritage significance is outlined through legislation in the Heritage Act and implemented through the *NSW Heritage Manual* and the *Archaeological Assessment Guidelines*.[1]

If an item or archaeological resource meets one of the seven heritage criteria, and retains the integrity of its key attributes, it can be considered to have heritage significance. The significance of an item or potential archaeological site can then be assessed as being of local or state significance. If a potential archaeological resource does not reach the local or state significance threshold, then it is not classified as a relic under the Heritage Act.

'State heritage significance', in relation to a place, building, work, relic, moveable object or precinct, means significance to the State in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.

'Local heritage significance', in relation to a place, building, work, relic, moveable object or precinct, means significance to an area in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item.[2]

The overall aim of assessing archaeological significance is to identify whether an archaeological resource, deposit, site or feature is of cultural value. The assessment will result in a succinct

[1] NSW Heritage Office 1996; 25-27
[2] This section is an extract based on the Heritage Office Assessing Significance for Historical Archaeological Sites and Relics 2009:6.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

statement of heritage significance that summarises the values of the place, site, resource, deposit or feature. The heritage significance assessment criteria are as follows:

Table 2: NSW heritage assessment criteria

Criteria	Description
A – Historical Significance	An item is important in the course or pattern of the local area's cultural or natural history.
B – Associative Significance	An item has strong or special associations with the life or works of a person, or group of persons, of importance in the local area's cultural or natural history.
C – Aesthetic or Technical Significance	An item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in the local area.
D – Social Significance	An item has strong or special association with a particular community or cultural group in the local area for social, cultural or spiritual reasons.
E – Research Potential	An item has potential to yield information that will contribute to an understanding of the local area's cultural or natural history.
F – Rarity	An item possesses uncommon, rare or endangered aspects of the local area's cultural or natural history.
G - Representativeness	An item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places of cultural or natural environments (or the cultural or natural history of the local area).

2.3.2 Archaeological research potential

In 1984, Bickford and Sullivan examined the concept and assessment of archaeological research potential; that is, the extent to which archaeological resources can address research questions. They developed three questions which can be used to assess the research potential of an archaeological site:

- Can the site contribute knowledge that no other resource can?
- Can the site contribute knowledge that no other site can?
- Is this knowledge relevant to:
  - General questions about human history?
  - Other substantive questions relating to Australian history?
  - Other major research questions?

In the 2009 guidelines *Assessing Significance for Historical Archaeological Sites and 'Relics'*, the NSW Heritage Division has since provided a broader approach to assessing the archaeological significance of sites, which includes consideration of a site's intactness, rarity, representativeness, and whether many similar sites have already been recorded, as well as other factors. This document acknowledges the difficulty of assessing the significance of potential subsurface remains, because the assessment must rely on predicted rather than known attributes.[3]

A site can have high potential for archaeological remains, and yet still be of low research potential if those remains are unlikely to provide significant or useful information.

[3] NSW Heritage Branch 2009

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

2.4 Assessment of heritage impact

This HIS has been prepared using the document *Statement of Heritage Impact* 2002, prepared by the NSW Heritage Office, contained within the *NSW Heritage Manual,* as a guideline.

Impacts on heritage are identified as either:

- Direct impacts, resulting in the demolition or alteration of fabric of heritage significance
- Indirect impacts, resulting in changes to the setting or curtilage of heritage items or places, historic streetscapes or views
- Potential direct impact, resulting in impacts from vibration and demolition of adjoining structures.

Specific terminology and corresponding definitions are used in this assessment to consistently identify the magnitude of the project's direct, indirect or potentially direct impacts on heritage items or archaeological remains. The terminology and definitions are based on those contained in guidelines produced by the International Council on Monuments and Sites (ICOMOS) [4] and are shown in Table 3. It is assumed that all direct and potential direct impacts are a result of construction. Indirect impacts are assumed to be operational unless specified as temporary in which case they are related to construction.

Table 3: Terminology for assessing the magnitude of heritage impact.

Magnitude	Definition
Major	Actions that would have a long-term and substantial impact on the significance of a heritage item. Actions that would remove key historic building elements, key historic landscape features, or significant archaeological materials, thereby resulting in a change of historic character, or altering of a historical resource. These actions cannot be fully mitigated.
Moderate	This would include actions involving the modification of a heritage, including altering the setting of a heritage item or landscape, partially removing archaeological resources, or the alteration of significant elements of fabric from historic structures. The impacts arising from such actions may be able to be partially mitigated.
Minor	Actions that would results in the slight alteration of heritage buildings, archaeological resources, or the setting of an historical item. The impacts arising from such actions can usually be mitigated.
Negligible	Actions that would results in very minor changes to heritage items.
Neutral	Actions that would have no heritage impact.

[4] Including the document *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties*, ICOMOS, January 2011.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.0 HERITAGE MANAGEMENT FRAMEWORK

3.1 Introduction

There are several items of legislation relevant to the project. Heritage listed items within 50 m of the study area were identified through a search of the following relevant state and federal statutory and non-statutory heritage registers, the results are included in the relevant sections below:

- World Heritage List
- Commonwealth Heritage List
- National Heritage List
- State Heritage Register
- Penrith LEP 2010
- Section 170 registers.

Items listed on these registers have been previously assessed against the NSW Heritage Assessment guidelines, as summarised in Table 2. Statements of heritage significance based on the NSW Heritage Assessment guidelines as they appear in relevant heritage inventory sheets and documents are provided in this assessment.

3.2 Environmental Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) provides a legislative framework for the protection and management of matters of national environmental significance, that is, flora, fauna, ecological communities and heritage places of national and international importance. Heritage items are protected through their inscription on the World Heritage List, Commonwealth Heritage List or the National Heritage List.

The EPBC Act stipulates that a person who has proposed an action that will, or is likely to, have a significant impact on a World, National or Commonwealth Heritage site must refer the action to the Minister for the Environment (hereafter Minister). The Minister will then determine if the action requires approval under the EPBC Act. If approval is required, an environmental assessment would need to be prepared. The Minister would approve or decline the action based on this assessment.

A significant impact is defined as “an impact which is important, notable, or of consequence, having regarded to its context or intensity.” The significance of the action is based on the sensitivity, value and quality of the environment that is to be impacted, and the duration, magnitude and geographic extent of the impact. If the action is to be undertaken in accordance with an accredited management plan, approval is not needed and the matter does not need to be referred to the Minister.

3.2.1 Commonwealth Heritage List

The Commonwealth Heritage List (CHL) has been established to list heritage places that are either entirely within a Commonwealth area, or outside the Australian jurisdiction and owned or leased by the Commonwealth or a Commonwealth Authority. The CHL includes Indigenous, historic, and natural heritage places owned or controlled by the Australian Government that reflect Australia’s development as a nation.

There are no heritage items listed on the CHL located within, or 50 metres of, the study area.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

3.2.2 National Heritage List

The National Heritage List (NHL) has been established to list places of outstanding heritage significance to Australia. It includes natural, historic and Indigenous places that are of outstanding national heritage value to the Australian nation.

There are no heritage items listed on the NHL located within, or 50 metres of, the study area.

3.3 NSW Heritage Act 1977

The NSW *Heritage Act 1977* (Heritage Act) is the primary piece of State legislation affording protection to heritage items (natural and cultural) in NSW. Under the Heritage Act, 'items of environmental heritage' include places, buildings, works, relics, moveable objects and precincts identified as significant. Significance is based on historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values. State significant items can be listed on the NSW State Heritage Register (SHR) and are given automatic protection under the Heritage Act against any activities that may damage an item or affect its heritage significance. The Heritage Act also protects 'relics', which can include archaeological material, features and deposits.

Under the Heritage Act, all government agencies are required to identify, conserve and manage heritage items in their ownership or control. Section 170 of the Act requires all government agencies to maintain a Heritage and Conservation Register that lists all heritage assets and an assessment of the significance of each asset. They must also ensure that all items inscribed on its list are maintained with due diligence in accordance with State Owned Heritage Management Principles approved by the Government on advice of the NSW Heritage Council. These principles serve to protect and conserve the heritage significance of items and are based on NSW heritage legislation and guidelines.

3.3.1 State Heritage Register

The SHR was established under Section 22 of the Heritage Act and is a list of places and objects of particular importance to the people of NSW, including archaeological sites. The SHR is administered by the Heritage NSW, Department of Premier and Cabinet (Heritage NSW, DPC) and includes a diverse range of over 1500 items, in both private and public ownership. To be listed, an item must be deemed to be of heritage significance for the whole of NSW.

There are no heritage items listed on the SHR located within, or 50 metres of, the study area.

3.3.2 Section 170 registers

Under the Heritage Act all government agencies are required to identify, conserve and manage heritage items in their ownership or control. Section 170 (s170) requires all government agencies to maintain a Heritage and Conservation Register that lists all heritage assets and an assessment of the significance of each asset. They must ensure that all items inscribed on its list are maintained with due diligence in accordance with State Owned Heritage Management Principles approved by the government on advice of the NSW Heritage Council. These principles serve to protect and conserve the heritage significance of items and are based on NSW heritage legislation and guidelines.

There are no heritage items listed on the s170 registers located within, or 50 metres of, the study area.

3.3.3 Relics provisions

The Heritage Act also provides protection for 'relics', which includes archaeological material or deposits. The primary aim of an archaeological significance assessment is to identify whether an archaeological resource, deposit, site or feature is of cultural value and therefore, considered to be a

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

'relic'.[1] Historical archaeological sites typically contain a range of different elements as vestiges and remnants of the past. Such sites will include 'relics' of significance in the form of deposits, artefacts, objects and usually also other material evidence from demolished buildings, works or former structures which provide evidence of prior occupations but may not be 'relics' ('works' – see Section 3.3.4).[2]

According to Section 139 (Division 9: Section 139, 140-146):

> 1. *A person must not disturb or excavate any land knowingly or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, damaged or destroyed unless the disturbance is carried out in accordance with an excavation permit.*
>
> 2. *A person must not disturb or excavate any land on which the person has discovered or exposed a relic except in accordance with an excavation permit.*
>
> 3. *This section does not apply to a relic that is subject to an interim heritage order made by the Minister or a listing on the State Heritage Register.*
>
> 4. *The Heritage Council may by order published in the Gazette create exceptions to this section, either unconditionally or subject to conditions, in respect of any of the following:*
>
> a) *Any relic of a specified kind or description,*
> b) *Any disturbance of excavation of a specified kind or description,*
> c) *Any disturbance or excavation of land in a specified location or having specified features or attributes,*
> d) *Any disturbance or excavation of land in respect of which an archaeological assessment approved by the Heritage Council indicates that there is little likelihood of there being any relics in the land.*

Section 4 (1) of the Heritage Act (as amended in 2009) defines a relic as:

> *...any deposit, artefact, object or material evidence that:*
>
> *relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and is of State or local heritage significance*

A relic has been further defined as:

> *Relevant case law and the general principles of statutory interpretation strongly indicate that a 'relic' is properly regarded as an object or chattel. A relic can, in some circumstances, become part of the land be regarded as a fixture (a chattel that becomes permanently affixed to land).*[5]

Excavation permits are issued by the Heritage Council of NSW, or its delegate, under Section 140 of the Heritage Act for relics not within an SHR curtilage or under Section 60 for significant

[1] OEH, Heritage Division, 2009. Assessing Significance for Archaeological Sites and 'Relics', p. 4
[2] OEH, Heritage Division, 2009. Assessing Significance for Archaeological Sites and 'Relics', p. 7
[5] *Assessing Significance for Archaeological Sites and 'Relics'*, Heritage Branch, Department of Planning, 2009:7.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

archaeological remains within an SHR curtilage. An application for an excavation permit must be supported by an Archaeological Research Design and Archaeological Assessment prepared in accordance with the Heritage NSW archaeological guidelines. Minor works that will have a minimal impact on archaeological relics may be granted an exception under Section 139 (4) or an exemption under Section 57 (2) of the Heritage Act.

3.3.4 Works

The Heritage Act defines 'works' as being in a separate category to archaeological 'relics'. 'Works' refer to remnants of historical structures which are not associated with artefactual material that may possess research value. 'Works' may be buried, and therefore archaeological in nature, however, exposure of a 'work' does not require approved archaeological excavation permits under the Act.

The following examples of remnant structures have been considered to be 'works' by the NSW Heritage Council:

- Former road surfaces or pavement and kerbing.
- Evidence of former drainage infrastructure, where there are no historical artefacts in association with the item.
- Building footings associated with former infrastructure facilities, where there are no historical artefacts in association with the item.
- Evidence of former rail track, sleepers or ballast.
- Evidence of former rail platforms and former platform copings.

Where buried remnants of historical structures are located in association with historical artefacts in controlled stratigraphic contexts (such as intact historic glass, ceramic or bone artefacts), which have the potential to inform research questions regarding the history of a site, the above items may not be characterised as 'works' and may be considered to be 'relics'. The classification of archaeological remains as a 'work' therefore is contingent on the predicted remains being associated with historical structures as well as there being no prediction of the recovery of intact artefactual deposits which may be of research interest.

3.4 Environmental Planning and Assessment Act 1979

The EP&A Act establishes the framework for cultural heritage values to be formally assessed in the land use planning, development consent and environmental impact assessment processes. The EP&A Act requires that environmental impacts are considered prior to land development; this includes impacts on cultural heritage items and places as well as archaeological sites and deposits. The EP&A Act also requires that local governments prepare planning instruments (such as LEPs) in accordance with the EP&A Act to provide guidance on the level of environmental assessment required.

The current study area falls within the boundaries of the Penrith City Council LGA and is subject to the Penrith LEP 2010.

The aim of the LEPs in relation to heritage is to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings, views and archaeological sites. The LEP's list items of heritage significance within the LGA.

3.4.1 Penrith Local Environmental Plan 2010

The Penrith LEP aims to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views; and to protect archaeological sites. The LEP lists sites assessed as being of local heritage significance and stipulate development

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

controls in relation to development proposed on or near heritage listed properties, archaeological sites, or Aboriginal places of heritage significance. Part 5 Clause 5.10 of the LEP lists the below objectives[6]:

> *(a) to conserve the environmental heritage of Penrith*
>
> *(b) to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabrics, settings and views,*
>
> *(c) to conserve archaeological sites,*
>
> *(d) to conserve Aboriginal objects and Aboriginal places of heritage significance.*

There are three LEP listed items within 50 metres of the study area:

- Penrith Council Chambers (former) (Penrith LEP 2010 Item No. 189)
- TAFE Building (Penrith LEP 2010 Item No. 689)
- Prospect Electricity building (former) (Penrith LEP 2010 Item No. 701).

3.4.2 Penrith Development Control Plan 2014

The Penrith DCP 2014 is a supporting document that compliments the provisions contained within the Penrith LEP 2010 and provides specific design detail in regard to sympathetic development on, or in the vicinity of, items listed on Schedule 5 of the Penrith LEP 2010.

Part C 7.1.4 and 7.1.5 of the DCP 2014 provides sympathetic considerations for development that is in the vicinity of a heritage listed item and the Heritage Conservation Area (HCA). These considerations include ensuring that the character, bulk, scale and height of new development does not unreasonably overshadow a nearby heritage item, that colouring and texture of new materials of a new development is sympathetic to a heritage item, and that views of a heritage item should not be obscured from the point of view of areas of public domain.

3.5 Non-statutory registers

3.5.1 Register of the National Estate

The Register of the National Estate is a list of natural, Aboriginal and historic heritage places throughout Australia. It was originally established under the *Australian Heritage Commission Act* 1975. Under that Act, the Australian Heritage Commission entered more than 13,000 places in the register. Following amendments to the *Australian Heritage Council Act* 2003, the Register of the National Estate (RNE) was frozen on 19 February 2007 and ceased to be a statutory register in February 2012. The RNE is now maintained on a non-statutory basis as a publicly available archive and educational resource.

There are no heritage items listed on the RNE located within, or 50 metres of, the study area.

3.5.2 Register of the National Trust

The National Trust of Australia is a community-based, non-government organisation committed to promoting and conserving Australia's Indigenous, natural and historic heritage. The Register of the National Trust (RNT) was established in 1949. It is a non-statutory register.

[6] Penrith Local Environmental Plan, 2010. Penrith City Council Local Government Area.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

There are no heritage items listed on the RNT located within, 50 metres of, the study area.

3.6 Unlisted potential heritage items

A single unlisted potential heritage item was identified by Artefact Heritage during the preparation of the preliminary Aboriginal and Non-Aboriginal Heritage Assessment for the proposal.[7] This potential item of heritage significance comprises the former John Price & Son funeral home located within the study area. A significance assessment is included in Section 7.1.4 of this report.

3.6.1 Summary of heritage listings

Table 4 provides a summary of heritage listed items within, or 50 metres of, the study area. These are illustrated in Figure 2.

Table 4: Summary of listings for heritage items in and near the study area.

Item	Listing	Level of significance	Address	Distance from study area
Penrith Council Chambers (former)	Penrith LEP 2010 Item No. 189	Local	129–133 Henry Street, Penrith 2750	15 metres north of study area
TAFE Building	Penrith LEP 2010 Item No. 689	Local	115–119 Henry Street, Penrith 2750	15 metres northeast of study area
Prospect Electricity building (former)	Penrith LEP 2010 Item No. 701	Local	59 Station Street, Penrith 2750	10 metres east of study area
John Price & Son Funeral Home (former)	Non-listed	Local	42-44 Station Street, Penrith 2750	Within study area

[7] Artefact Heritage, 2020. Penrith City Park – Aboriginal and Non-Aboriginal Preliminary Heritage Assessment. Report prepared for Penrith Council.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

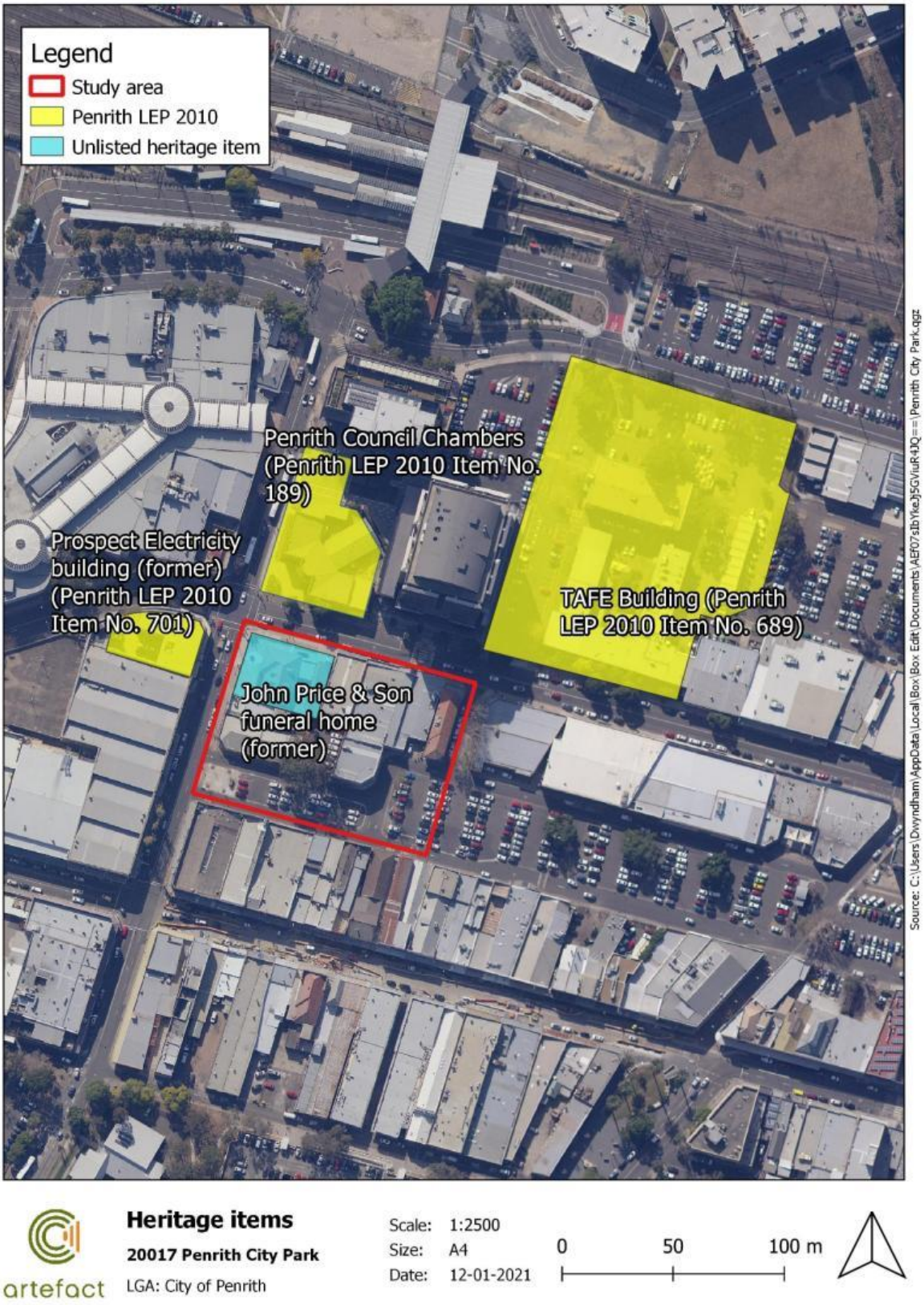

Figure 2: Heritage items overview map

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4.0 HISTORICAL CONTEXT

This section has been adapted from the history provided in Artefact Heritage's Aboriginal and Non-Aboriginal Heritage Assessment for Penrith City Park (2020).

4.1 Aboriginal history

Prior to the appropriation of their land by Europeans, Aboriginal people lived in small family or clan groups that were associated with particular territories or places. It seems that territorial boundaries were fairly fluid, although details are not known. The language group spoken on the Cumberland Plain is known as Darug (Dharruk – alternative spelling). This term was used for the first time in 1900[8], as before the late 1800s language groups or dialects were not discussed in the literature.[9] The Darug language group is thought to have extended from Appin in the south to the Hawkesbury River, west of the Georges River, Parramatta, the Lane Cove River and to Berowra Creek.[10] This area was home to a number of different clan groups throughout the Cumberland Plain. It is thought that the Aboriginal people living in the Penrith area in the early nineteenth century belonged to the Darug language group.[11]

The British initially thought that Aboriginal people did not live inland but were confined to the coast taking advantage of the abundant marine resources available. The first major expeditions into the interior did not witness any Aboriginal people, but evidence of their existence was noted. In 1789 Captain Watkin Tench led an expedition to the Nepean River.[12] He noted that;

> *Traces of the natives appeared at every step, sometimes in their hunting huts which consist of nothing more than a large piece of bark bent in the middle and opened at both ends, exactly resembling two cards set up to form an acute angle; sometimes in marks on trees which they had climbed; or in squirrel-traps…. We also met with two old damaged canoes hauled up on the beach.*

It was not until rural settlement began in the western Cumberland Plain, around 1791 that the colonists and Aboriginal people came face to face. Relations quickly disintegrated, and tensions over land and resources spilled over. Governor King sanctioned the shooting of Aboriginal people in a General Order made in 1801.[13] Intermittent killings on both sides continued for over 15 years, including the Appin massacre and attacks at South Creek in 1816.[14] [15]

British colonisation had a profound and devastating effect on the Aboriginal population of the Sydney region, including Darug speakers. In the early days of the colony Aboriginal people were disenfranchised from their land as the British claimed areas for settlement and agriculture. The colonists, often at the expense of the local Aboriginal groups, also claimed resources such as grassland, timber, fishing grounds and water sources. Overall, the devastation of the Aboriginal culture did not come about through war with the British, but instead through disease and forced

[8] Mathews, R. H. and M. M. Everitt 1900 The Organisation, Language and Initiation Ceremonies of the Aborigines of the South-East Coast of N. S. Wales. *Journal and Proceedings of the Royal Society of New South Wales* 34:262–81.
[9] Attenbrow 2010 Sydney's Aboriginal Past: Investigating the Archaeological and Historical Records University of New South Wales Press Ltd, Sydney: 31
[10] Attenbrow 2010: 34.
[11] Kohen, J.L. 1986. Prehistoric settlement in the western Cumberland Plain: Resources, environment and technology (Unpublished PhD thesis; Macquarie University): 3.
[12] Tench, W. 1789, 1793. Sydney's first four years: being a reprint of A narrative of the expedition to Botany Bay and A complete account of the settlement at Port Jackson. Reprinted in 1961. (Angus and Robertson in association with RAHS).
[13] Kohen 1986. 24.
[14] Karskens, G. 2010 The Colony: A History of Early Sydney. Allen and Unwin, Sydney: 225.
[15] Kohen 1986.:23.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

removal from traditional lands. It is thought that during the 1789 smallpox epidemic, over half of the Aboriginal people of the Sydney region died. The disease spread west to the Darug of the Cumberland Plain and north to the Hawkesbury. It may have in fact spread much further afield, over the Blue Mountains.[16] This loss of life meant that some of the Aboriginal groups who lived away from the coastal settlement of Sydney may have disappeared entirely before Europeans could observe them or record their clan names.[17]

Descendants of Darug language speakers continued to live in Western Sydney along with Aboriginal people from other areas of NSW, and in the present-day, the study area falls within the area of the Deerubbin LALC.

4.2 Early development of Penrith

Exploration west of Parramatta, within the Nepean Region, began shortly after the arrival of the First Fleet, with the first expedition conducted by Captain Watkin Tench in 1789. The following year, Tench and Lieutenant William Dawes further explored the area, discovering the Nepean River which Tench described as being as 'broad as the Thames at Putney'.[18]

Land within the Penrith region was being granted by the early 1800s, the first of which was awarded to Captain Daniel Woodriffe in 1804 (1000 acres). Woodriffe's grant covered the majority of present-day Penrith (including the study area), straddling the parishes of Castlereagh and Mulgoa (Figure 3 - Figure 4).[19] Woodriffe named the property Rodley Farm however it is likely that he never resided at the property as he left for England in the same year. The farm was leased to William Martin until 1821.

Arguably one of the most significant motivators in the development of Penrith were the transport and communication routes established from Sydney through Penrith and across the Blue Mountains. Following the expedition across the Blue Mountains by Gregory Blaxland, William Lawson and William Wentworth in 1813, Surveyor George Evans journeyed further west and surveyed a route extending from Penrith to the eventual site of Bathurst.[20] A government punt was established at this time to cross the Nepean River, which was operated by William Martin who provided refreshments, accommodation and goods for waiting travellers.[21] A single-track railway line to Penrith was opened in 1863 (180 metres north of the study area). The railway line runs directly through the 1000-acre Woodriffe land grant (Figure 5). The line was duplicated in 1886, and with the extension over the Blue Mountains, Penrith became an important railway centre.[22]

The Woodriffe property was leased to John and Sarah McHenry in 1821, who also owned the adjoining property. McHenry was critical of Martin's lack of enterprise at the property stating that it was 'in a state of nature'. The McHenrys hired clearing gangs from the Emu Plains convict farm to improve the productivity of the estate.[23] The estate was divided into two leases in 1830, one either side of the Great Western Road. John McHenry continued to lease the northern side (including the study area), whilst Jacob Josephson leased the southern side.

[16] Butlin, N.G. 1983 Our Original Aggression: Aboriginal Populations of Southeastern Australia 1788-1850 George Allen and Unwin, Sydney.
[17] Karskens 2010: 452.
[18] Captain Watkin Tench, 1793. *A Complete Account of the Settlement at Port Jackson in New South Wales.* London.
[19] Pollon. *The Book of Sydney Suburbs.* 203-204.
[20] State Library of New South Wales, 2017. 'Crossing the Blue Mountains, Sydney.' Accessed online at: https://www.sl.nsw.gov.au/blogs/crossing-blue-mountains-sydney (December 2020).
[21] Penrith Local History, 2011. 'The Woodriff Estate: Landlord and Tenant'. Accessed online at:. https://penrithhistory.com/home/makings-of-a-city-history-conference/the-makings-of-a-city-history-conference-2011/2011-conference-the-woodriff-estate/ (December 2020).
[22] Office of Environment and Heritage, 2009. 'Penrith Railway Station Group and Residence'. Accessed online at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=4801032 (December 2020).
[23] Lorraine Stacker. *Chained to the Soil on the Plains of Emu: A History of the Emu Plains Government Agricultural Establishment 1819-1832*, Penrith, 2000, 21.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Upon Woodriffe's death, the farm was divided in two and inherited by Francis Henry Woodriffe and his brother Frederick Daniel Woodriffe.[24] When the McHenry and Josephson lease expired in 1851, the Woodriffe property was divided into farm and town lots and leased in 1852 to sixteen tenants. These tenants included Philpott Robbins, Edward Heavy, William Barlow and Henry Wilson.[25] By the late 1800s, Francis Henry Woodriffe had established 'Combewood' House (extant) off Castlereagh Road, north of the railway line; and his brother Frederick Daniel Woodriffe had completed work on 'Rodley' House (demolished) off Mulgoa Road, south of the railway line.

The Woodriffe Estate became known as Lower Penrith, and although it was low-lying and flood prone, farms, hotels, shops and houses were developed creating a community of workers, farmers and business people.[26] Notable developments within Penrith during these early years included the colony's first Georgian manor, Regentville House in 1824 (burned down in 1868); a post office opened in 1828; St Stephens Anglican Church consecrated in 1839; St Nicholas of Myra Catholic Church consecrated in 1850, the first bridge over the Nepean built in 1856 (washed away by flood 1857); and a school established in 1865. Penrith became a municipality in 1871, and an official city in 1959.[27]

Figure 3: c1820s Castlereagh Parish map showing the study area within Captain Daniel Woodriffe's 1000-acre grant (Source: Land Registry Services)

[24] Office of Environment and Heritage, 2005. 'Combwood – House, Garden, Trees and Original Entrance Drive'. Accessed online at: https://www.environment.nsw.gov.au/heritageapp/ViewHeritageItemDetails.aspx?ID=2260163 (December 2020).
[25] Penrith Local History, 2011. 'The Woodriff Estate: Landlord and Tenant'.
[26] Penrith Local History, 2011. 'The Woodriff Estate: Landlord and Tenant'.
[27] Penrith City Council, n.d. 'Penrith Local Suburb Profiles'. Accessed online at: https://web.archive.org/web/20080614014522/http://www.penrithcity.nsw.gov.au/index.asp?id=436 (December 2020).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

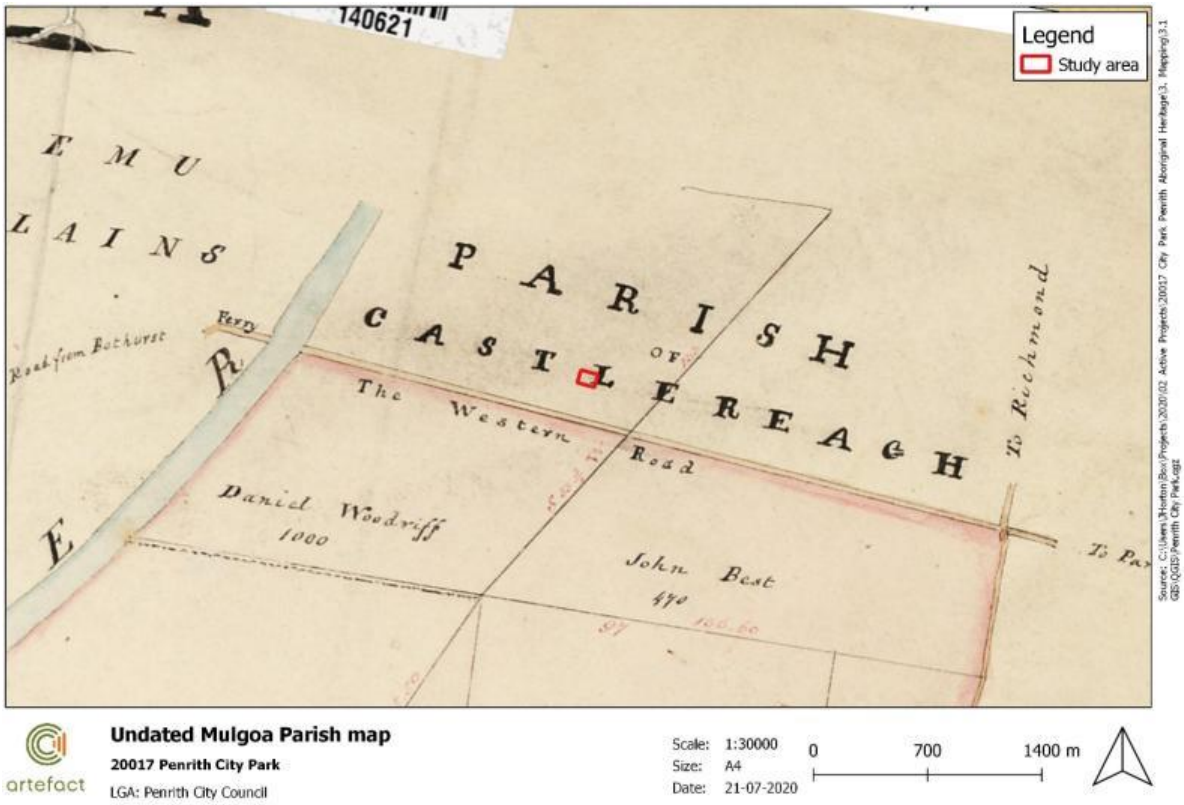

Figure 4: Undated Mulgoa Parish map showing the study area within Captain Daniel Woodriffe's 1000-acre grant (Source: Land Registry Services)

Figure 5: 1883 Castlereagh Parish map showing railway line through Captain Daniel Woodriffe's 1000-acre grant (Source: Land Registry Services)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

4.3 Development of the study area

The study area falls within the original 1000-acre land grant made to Captain Daniel Woodriffe in 1804. Following its lease to the McHenrys in 1821, the land was cleared and used for agricultural purposes. Though the exact nature of the agricultural/pastoral uses of the study area are unknown, it is likely that the land was cleared of vegetation and fenced. Following the establishment of the railway north of the study area in 1863, an orchard was established on the Woodriffe grant; however, this orchard was known to have been planted north of the railway line. An 1883 parish map shows the existence of the railway line, with an established road leading to Parramatta located south of the study area (Figure 5). There is no sign of any structures in the area at this time.

By the late 1880s, development south of the railway line had increased rapidly. A c1880 subdivision plan of Penrith indicates that streets including Station, Henry and High Street were in place by this time, close to their current alignments (Figure 6). Development along High Street was flourishing, with structures including two 'stores', a 'shop' and a hotel clearly labelled on the subdivision map. It is likely that these businesses, the largest in the plan, would have included rear yards and possible outbuildings; however, these types of buildings were rarely included on subdivision plans. Outbuildings may have included privies, sheds and stables. Five structures, labelled as 'shops' on the subdivision plan, can be seen within the study area on Henry Street. These structures are significantly smaller than the High Street businesses.

As Penrith grew, more local businesses appeared in the study area. By 1886, Mr William G. Ransley and his business partner Mr. Dormer had opened a Livery and Bait Stables on the corner of Henry and Station Streets, in the northwest corner of the study area.[28] The business supplied buggies, waggonettes and saddle horses for hire alongside land and stables for residents to board their horses.[29] At some time after 1886, the business began operating under the name W.G. Ransley.[30]

In July 1888, Ransley had gone into business with John Priddle and the pair were offering buggies and waggonettes to Riverstone as well as furniture removal services.[31] However, by November 1889 the pair had dissolved their partnership and the business had been transferred to Priddle.[32] Priddle and his wife Louisa resided at the property and subsequently expanded the business to include a blacksmith's shop and lolly shop.[33] The lolly shop was run by Louisa and occupied a building next door. It is likely that the small buildings seen in the c1880 subdivision plan (Figure 6) were demolished or modified to make way for the Priddle businesses.

In 1908, Louisa sold the businesses to Nelson Price, a local merchant and undertaker, following the John Priddle's death in 1897.[34] Though no images of High Street are available at the time, photographs of Station and High Streets in the c1910s show the general nature of the commercial structures south of the study area (Figure 7 and Figure 8). The majority of buildings along High Street were two-storey commercial premises with extensive verandahs. A photograph from c1919 shows the 'States Boot Manufacturing Company', a business that occupied the corner of Station and High Streets south of the study area (Figure 8). The large store included a shaded portico and balcony with iron lace detailing. It is likely that the yard areas and outbuildings associated with the High Street businesses, including the States Boot Manufacturing Company, extended into the southern portion of the study area.

[28] Nepean Times, Thu 8 Oct 1936, Penrith 50 Years Ago, p. 8. Accessed via Trove on 19/01/2020.
[29] Nepean Times, Sat 1 May 1886, Advertising, p. 5.
[30] Casey and Lowe, 2008. Archaeological Assessment Western Precinct St Marys Development, St Marys, p. 19.
[31] Nepean Times, Sat 28 Jul 1888, Advertising, p. 3 and Nepean Times, Sat 10 Nov 1888, Advertising, p. 5.
[32] Nepean Times, Sat 30 Nov 1889, Advertising, p. 5.
[33] Penrith City Local History, n. d. John Price & Son Funeral Home. Accessed online at: https://penrithhistory.com/industries/john-price-son-funeral-home/ on 19/01/2021.
[34] Obituaries Australia, National Centre of Biography, Australian National University, n. d. 'Priddle, Louisa Winifred (1862–1943)'.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

By the 1940s, development occupied the majority of the study area. An aerial photograph of Penrith from 1943 shows the study area occupied by medium-sized structures and outbuildings. At this time, the north-eastern corner of the study area remained relatively undeveloped, with a small structure and associated yard present in the aerial (Figure 9). The aerial also shows the development of a roadway/lane inside the study area, roughly following the present-day alignment of Allen Place. This may have been used as a night soil lane prior to the introduction of formalised sewerage systems in the twentieth century.

The Priddle businesses, now owned by Nelson Price, are discernible in the north-western portion of the study area. Multiple rear yards associated with the High Street businesses comprise the southern portions of the study area, with outbuildings of various sizes clearly visible. These businesses included a Commonwealth Employment Office at 505 High Street (1930s-1950s), Dry Cleaners and Dyers at 503 High St (1930-1950s), Hardware, Crockery and Appliance Store at 499 High Street, and Handleys Home Appliance specialists (1940-1950s). Though the exact nature of the outbuildings is unknown, it is likely that they were similar in nature and materials to a nearby rear yard in Henry Street (Figure 11). The outbuildings in the Henry Street yard were simply fashioned and made of timber and corrugated iron.

Following the Second World War, the study area underwent a large-scale demolition, with modern development occurring in the 1950s and 1960s. All buildings featured in the 1940s aerial were demolished during this time, with the John Price & Son funeral home and other mid-twentieth century shops built within the study area. A number of government and civic buildings were constructed adjacent to the study area during this period, including the former Penrith Council Chambers, TAFE Building and Prospect Electricity Building. The Allen Place car park was established in within the study area in 1964 to provide extra car parking.[35]

A comparison of aerial imagery from 1980 - 2007 indicates that a multi-storey carpark was established along Allen Place by the 1980s, with an overpass to another multistorey carpark on Station Street (Figure 12 - Figure 16). The Allen Place multi -storey car park was demolished in 2017. The structures within the study area do not appear to change significantly throughout the late twentieth and early twenty-first century imagery, however it is likely that a number of internal and external modifications did take place.

[35] Penrith City Council, n.d. 'Allen Place'. Accessed online at: https://penrithcity.spydus.com/cgi-bin/spydus.exe/ENQ/WPAC/ARCENQ?SETLVL=&RNI=293411 (December 2020).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

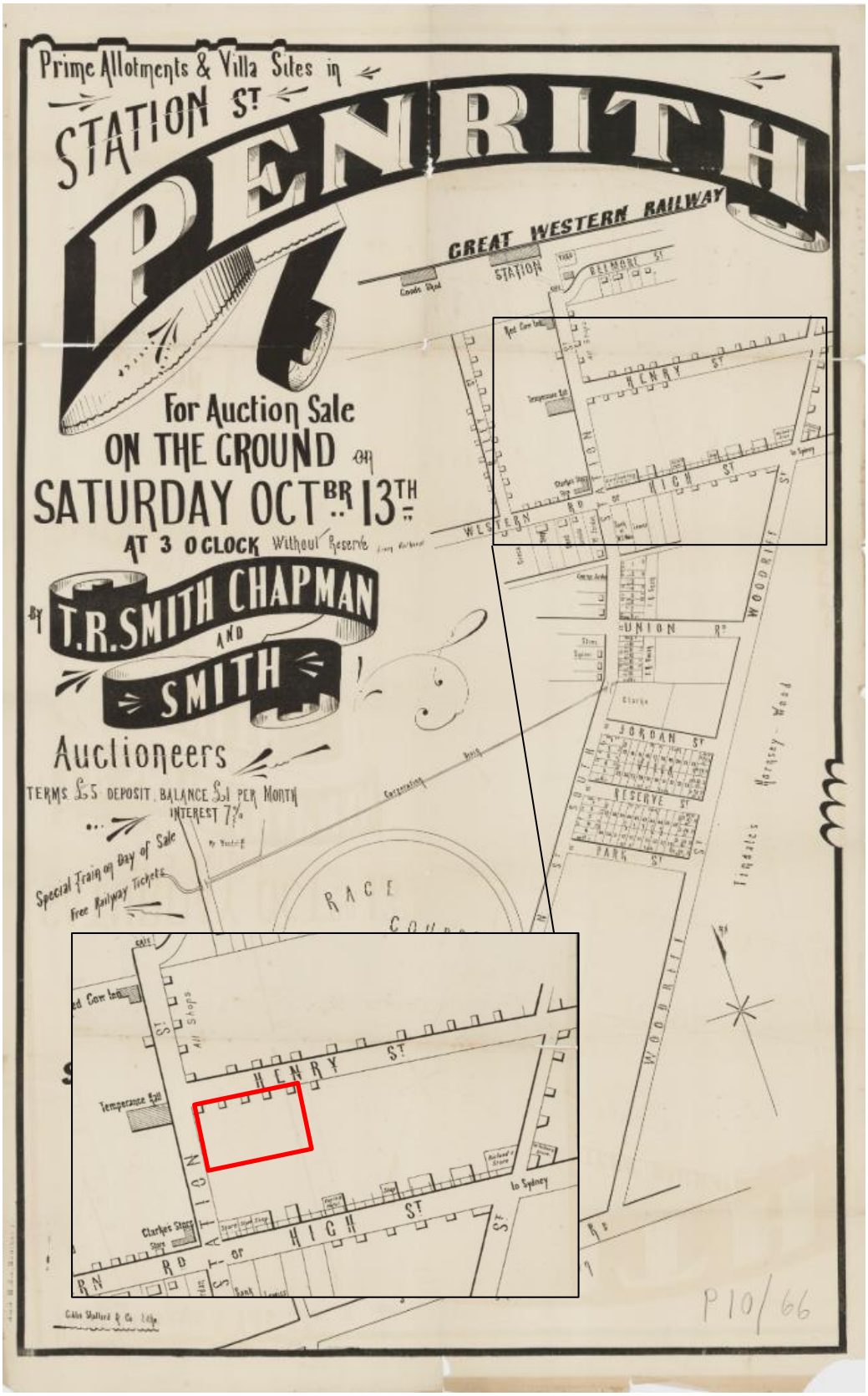

Figure 6: Penrith subdivision plan, c1880s (Source: State Library NSW). Shops can be seen along Henry Street within the study area, while established structures labelled 'store' and 'shop' can be seen south of the study area along High Street. It is likely that outbuildings for the High Street businesses would have been present by this time.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figure 7: View east along High Street from the Station Street intersection showing the nature of structures to the south of the study area (Source: Penrith City Council)

Figure 8: View east along High Street at the Station Street intersection, c1919. These commercial premises for the States Boot Manufacturing Company was located to the south of the study area, though outbuildings from this shop extended into the study area (Source: Penrith City Council)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figure 9: c1940s aerial imagery showing development within the study area (Source: SixMaps)

Figure 10: Shop fronts along High Street, 1946, to the south of the study area (Source: Penrith City Council)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figure 11: Rear of a home along Henry Street (Source: Penrith City Library).[36] This image provides an indication into the types of outbuildings that would have been present within the study area.

Figure 12: c1980s aerial imagery of Penrith, looking east (Source: Penrith City Council). Study area outlined in red.

[36] Penrith City Library, c1950s. 'Price family home, Henry Street'. Accessed online at: https://penrithcity.spydus.com/cgi-bin/spydus.exe/FULL/WPAC/ALLENQ/335032/3098113,98 (December 2020).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

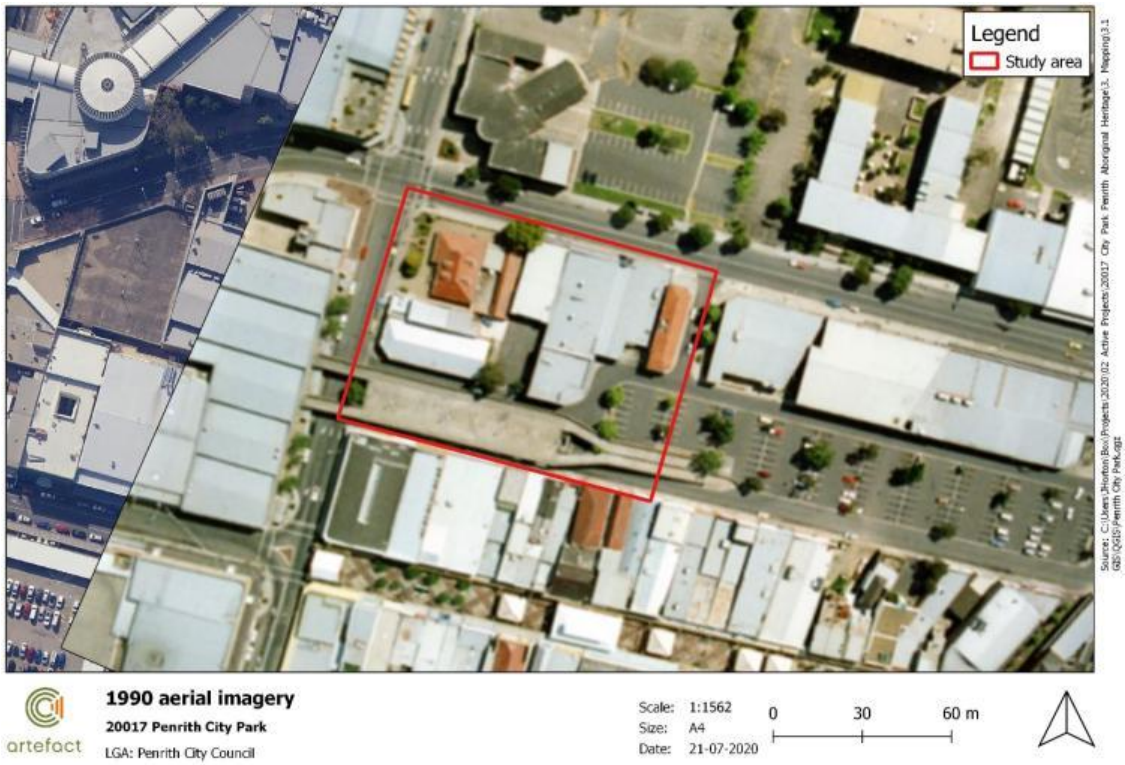

Figure 13: 1990 aerial imagery showing multi-storey carpark within study area (Source: Penrith City Council)

Figure 14: 1994 photograph showing Station Street and High Street intersection (Source: Penrith City Council). Showing existing development to the south of the study area.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figure 15: 2001 image showing Station Street and High Street intersection and existing development to the south of the study area (Source: Penrith City Council). Access bridge to multi-storey carpark can be seen in the background, present-day development seen within foreground.

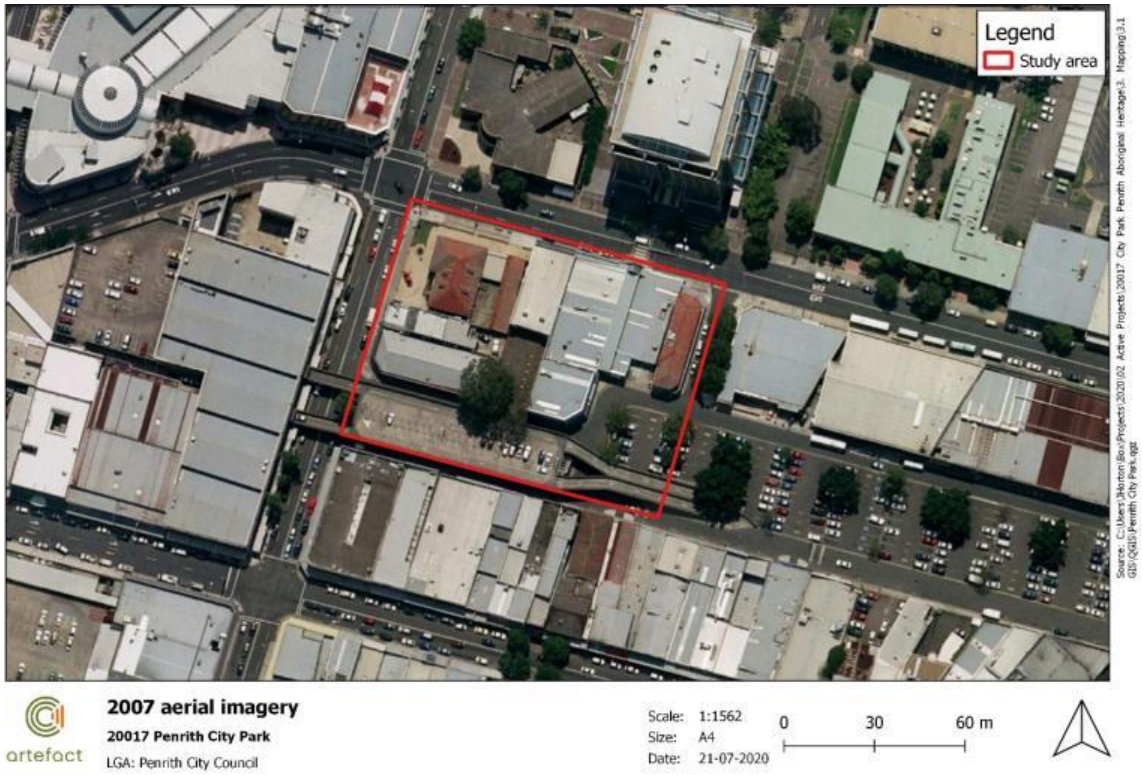

Figure 16: 2007 aerial imagery showing multi-storey carpark along Allen Lane within the study area (Source: Google Earth)

4.3.1 John Price & Son Funeral Home

The corner of Station and Henry Streets (in the north-western corner of the study area) is known to have once been the site of a livery stable business, residence, lolly shop and blacksmith's shop, on land leased from the Woodriffe family. The original livery stables were operated by the Priddle family from the late 1800s until 1908, when Louisa Priddle sold the business to Nelson Price.[37] Price

[37] Penrith City Local History, n.d. 'John Price & Sons Funeral Home'. Accessed online at: https://penrithhistory.com/industries/john-price-son-funeral-home/ (December 2020).; Death of Mrs. L. W. Priddle (1943, November 4). *Nepean Times (Penrith, NSW: 1882 - 1962)*, 1. Accessed online at: http://nla.gov.au/nla.news-article117894072 (December 2020).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

continued to operate the livery stables and blacksmith's shop, eventually purchasing the land from the Woodriffes in 1927 for 700 pounds. Price lived in the High Street residence from 1927.[38]

John Price & Son, a funeral business, had been established in Penrith in 1855 by John Price, an undertaker and monumental mason. John Price and his family resided on a property along Henry Street, next door to the former Methodist Church (Figure 11). The Price family was heavily involved in the funeral industry of Penrith, with John's son working as the undertaker, a nephew working as a gravedigger and a rival funeral business set up by Nelson and Arthur Price.[39] The well-respected business offered funeral services and carved gravestones and monuments; in 1922, the firm was engaged to carve the Penrith Soldiers Memorial tablets.[40] Upon John's death in the 1890s, his wife Elizabeth ran John Price & Son until her own passing in 1920; during this time the business was referred to as Mrs John Price & Son. The business was run for a short time by a Mr Leo Price. Nelson Price took over the business in 1924 and ran it alongside the livery stables and blacksmiths shop. Price moved to a new house at 480 High Street in 1927, continuing to operate the funeral business from his home.[41]

In 1949, Nelson sold his properties to the Rural Bank of NSW, dying a few days later.[42] The Rural Bank sold the property at the corner of Station and Henry Streets to William Frederick Smith of Penrith Motors in 1950, along with the business name of John Price & Son.[43] A funeral home was purpose-built on this site during Smith's period of ownership, likely in early 1954 (Figure 18). An article in the Nepean Times from November 1954 praised the 'architectural and structural beauty' of the new funeral home, stating:

> *The new structure is a thing of beauty and is a very modern type that will enhance the appearance of Station Street. The chapel and other rooms are very modern.*[44]

The funeral home was designed by Frederick Paskin of Penrith, and comprised a parlour, a large lounge, offices, ladies' retiring rooms, a chapel and clergy room.[45] A separate block at the rear of the property housed garages, workrooms, storerooms and amenities. The manager's residence was also incorporated into the funeral home, with bedrooms, a kitchenette, dining rooms and bathroom. The distinctive Flemish bond bricks were made from Chromatex bricks sourced from Heathcote. The ornamental garden in the front courtyard was laid by Mr. E Summons.[46] The designer of the unusual octagonal brick fountain in the front courtyard is unknown, but an image from 1957 shows the fountain in situ (Figure 18).

John Price & Son funeral home continued operation under various ownership up until 2014 when its name was changed to 'Supremacy Funerals'. Today, the business has officially moved from the building to another location on High Street south of the study area.[47]

[38] The Late Mr. Nelson Price (1949, September 29). Nepean Times (Penrith, NSW: 1882 - 1962), 6. Accessed online at: http://nla.gov.au/nla.news-article117914290 (December 2020).
[39] Penrith City Local History, n.d. 'John Price & Sons Funeral Home'.
[40] Penrith Soldiers' Memorial. (1922, April 22). Nepean Times (Penrith, NSW: 1882 - 1962), 2. Accessed online at: http://nla.gov.au/nla.news-article104675530 (December 2020).
[41] The Late Mr. Nelson Price (1949, September 29). Nepean Times (Penrith, NSW: 1882 - 1962), 6. Accessed online at: http://nla.gov.au/nla.news-article117914290 (December 2020).
[42] Ibid.
[43] Duns Gazette, Vol. 84 No. 18 (November 13, 1950). Accessed online at: https://nla.gov.au/nla.obj-778926839/view?sectionId=nla.obj-796199619&partId=nla.obj-779014025#page/n4/mode/1up (December 2020).
[44] Parlours Open Next Wednesday (1954, November 25). Nepean Times (Penrith, NSW: 1882 - 1962), 6. Accessed online at: http://nla.gov.au/nla.news-article100987410 (December 2020).
[45] Modern Station Street Building (1954, May 20). Nepean Times (Penrith, NSW: 1882 - 1962), 1. Accessed online at: http://nla.gov.au/nla.news-article100984879 (December 2020).
[46] Ibid.
[47] Penrith City Local History, n.d. 'John Price & Son Funeral Home'.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figure 17. Advertisement for new location of John Price & Son funeral home, December 2, 1954. (Source: The Nepean Times via National Library of Australia)

Figure 18: John Price & Son funeral home, 1957. (Source: Blue Mountains Gazette.[48])

[48] Blue Mountains Gazette, 24 July 2019. 'Care and compassion is key at Supremacy Funerals'. Accessed online at: https://www.bluemountainsgazette.com.au/story/6288980/care-compassion-the-key/ (December 2020).

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

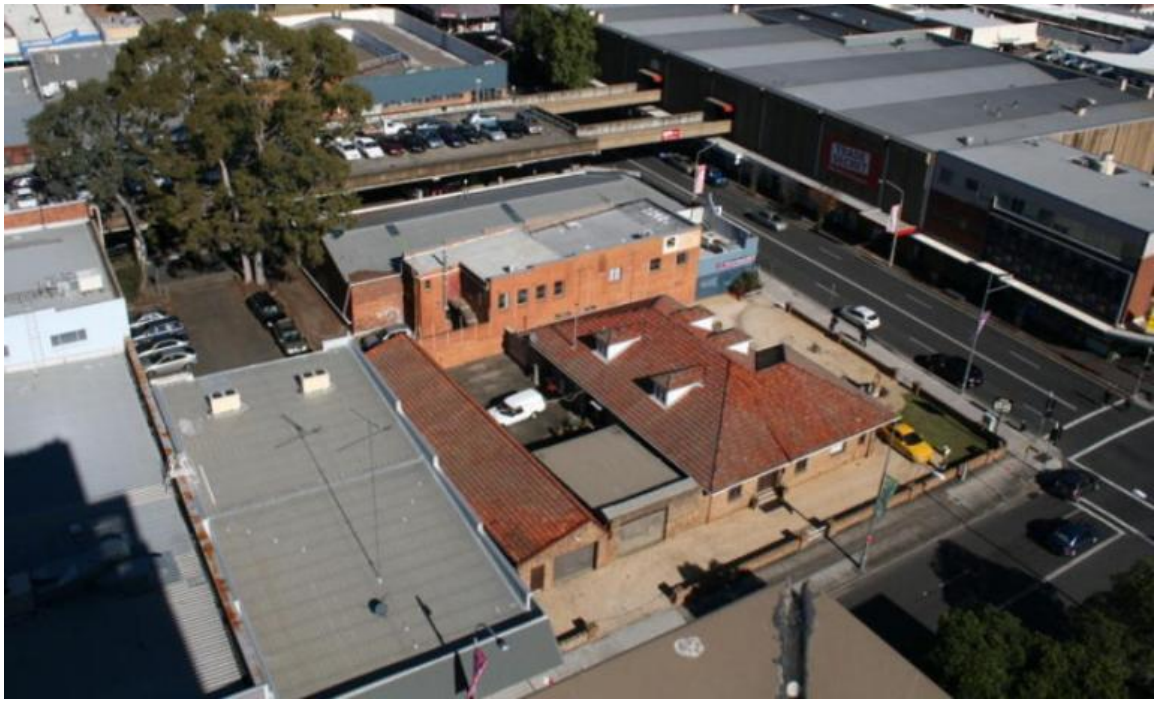

Figure 19. Aerial photograph of John Price & Son building from Station Street, showing the layout of the funeral home. (Source: Penrith City Library)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

5.0 SITE INSPECTION

5.1 Introduction

An inspection of the study area was undertaken by Darrienne Wyndham (Heritage Consultant, Artefact Heritage) and Olivia Turner (Heritage Consultant, Artefact Heritage) on 13 January 2021. A previous site visit had been conducted by Jessica Horton (Heritage Consultant, Artefact Heritage) on 22 July 2020 during the preparation of the preliminary heritage assessment report. The aim of the inspection was to investigate the exterior and interior of the former John Price & Son funeral home and identify and assess potential impacts of the proposed works to surrounding heritage items, including impacts to potential archaeological deposits within the study area and historic views and vistas.

The inspection was undertaken on foot, using physical maps and GPS. A photographic record was made during the inspection.

Access was provided to the interior of the funeral home and the rear outbuildings. Upper storey access was not permitted due to asbestos contamination.

5.2 Description

The study area is focused on the junction of Station Street with Henry Street and Allen Place, and is located within the central business district of Penrith. The wider setting of the study area is characterised by its context, featuring a combination of commercial development and car parking facilities. The structures within the study area are predominantly commercial, comprising a number of low-rise Post-Second World War shop fronts. A large parking facility is present in the southern and south-eastern portions of the study area.

All of the listed heritage items identified in Table 4 were visible from the study area during the site inspection, with view lines intact.

The surrounding landscape comprises commercial development and carparking facilities to the north, south and east, the former Penrith Council Chambers to the north, the TAFE Buildings to the northeast and the former Prospect Electricity Building to the west, which is now occupied by a dental practice and various other businesses. The Council Chambers and former Prospect Electricity building have a close and uninterrupted visual link with the site, with the corner location of the funeral home being directly opposite both.

5.3 John Price & Son Funeral Home

John Price & Son, the Post-War unlisted heritage item, is situated within the north-western portion of the study area. The funeral home stands out in the commercial area as a unique post-war residential scale building in the centre of the business area, visually separated from the surrounding buildings due to a large courtyard. The funeral home appears externally intact and very similar to c1957 images of the building, with only changes to ephemeral aspects of the setting such as plantings.

The exterior of the building is in good condition with the exception of missing or broken fascia and soffit boards to the south-western corner of the roof. The provenance of the terracotta roof tiles used was visible during the site inspection – with stamps indicating tiles were mostly produced by Porter & Galbraith of Doonside, NSW, though one tile (possibly a replacement) read Cumberland, Bankstown, NSW. The specific moulded brick employed in the construction of the building was also evident during site inspection with the ‘Chromatex’ stamp clearly visible on exposed brick bases.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Internally, the building is in good condition and appears to substantially retain internal features, fittings and finishes. Floorboards are the main flooring throughout the building, with minor areas of damage evident in the front parlour. Internal features including cornices remained intact. It is likely that the utilitarian interior design of the building remains true to its original form and operation. Light fittings appeared to post-date the construction of the building, and window fittings and glass appeared original.

No evidence of basement or cellar space was observed during the site visit, with a Council representative onsite confirming that no basement exists. The rear yard of the main building is concreted and connects to the concrete bases of the garage and service areas. Landscaping to the front courtyard of the building consisted of concrete paths and gravel fill. There was no surface evidence of any archaeological remains or former development observed during the site inspection.

5.4 Images

Figure 20: View southwest along Gaymark Lane showing commercial development within the study area

Figure 21: View southwest from Gaymark Lane showing commercial development and carparking facilities within the study area

Figure 22: View northwest showing commercial development and carparking facilities within the study area

Figure 23: View southwest showing carparking facilities within the study area and surrounding commercial development

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figure 24: View northwest along Allen Place showing commercial development and carparking facilities within study area

Figure 25: View north within study area from Allen Place showing rear of commercial developments and carparking facilities

Figure 26: View northwest from the study area along Allen Place showing commercial development and multistorey carparking facilities

Figure 27: View northeast from Station Street showing commerical development at the junction with Allen Place within the study area

Figure 28: View east from Station Street showing commercial development and funeral home (left) within study area

Figure 29: View east from Station Street towards Henry Street showing funeral home (right) and former Council Chambers (left)

Figure 30: View southwest from Henry Street towards study area showing funeral home (right) and commercial development (left)

Figure 31: View south from Henry Street towards study area showing commercial development

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figure 32. View north-east from Henry Street towards former Council Chambers building (left) and modern development (right)

Figure 33. View north from former John Price & Son funeral home towards former Council Chambers building

Figure 34. View south from former Council Chambers building towards the study area and John Price & Son funeral home

Figure 35. View west from former John Price & Son funeral home towards the former Prospect Electricity building

Figure 36. View east from the former Prospect Electricity building towards the study area

Figure 37. View north-east from Henry Street within study area towards the TAFE Building heritage item

Figure 38. View south-west from the TAFE Building heritage item towards the John Price & Son funeral home within the study area

Figure 39. View south-east from the TAFE Building heritage item towards the study area

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.0 ARCHAEOLOGICAL ASSESSMENT

6.1 Known land use

As discussed in the historical background section of this report, the study area has been subject to a number of land use phases, with three historical development phases and one modern development phase.

The study area has been used for commercial and residential activities since the nineteenth century, with use before that likely consisting of land clearance as part of the early land grants in the region. For the purposes of this assessment, the potential archaeology of the study area has been divided into the following phases:

- Phase 1: Early Land Grants (1789 – c1850)
- Phase 2: Nineteenth Century Commercial Development (c1850 – c1899)
- Phase 3: Early Twentieth Century Commercial Development (c1900 – c1950)
- Phase 4: Post-War Demolitions and Redevelopment (c1950s – present).

The following discussion of archaeological potential is focused on those areas identified as having the potential to contain archaeological resources. A map showing the locations of the known historical structures that occupied the study area is included in Figure 40.

6.1.1 Phase 1: Early Land Grants (1789 – c1850)

Phase 1 is defined by the first land grant in the study area, made to Captain Daniel Woodriffe in 1804.

Woodriffe left for England in 1804 and is not known to have built upon the land. Historical plans and parish maps indicate that the area was sparsely developed until the late nineteenth century, likely due to its inaccessibility and isolated nature prior to the coming of the railway.

Woodriffe's property (including the study area) was leased to William Martin in 1804. Records show that the land was largely untouched until 1821 when John and Sarah McHenry took over the property. During McHenry's lease of the property, extensive land clearing activities took place. No residences or other structures are shown in the study area on maps during this time. Undocumented tracks and accessways to the property may have been present.

The removal of vegetation for timber getting, and preparation of the land for agricultural use, would likely have been the earliest land-use in the study area. Activities such as tree clearance, fence construction, the development of unsealed roads and agricultural planting leave little material evidence and are not likely to be identified.

Potential remains from this land use phase may include evidence of agricultural/pastoral practices such as postholes and tree boles, although these would be highly ephemeral.

6.1.2 Phase 2: Nineteenth Century Commercial Development (c1850-c1899)

Phase 2 is defined by the initial large subdivision of the Woodriffe Estate in 1852 to sixteen tenants, with subsequent re-subdivision and development to accommodate a growing township.

A railway line was constructed in Penrith in 1863. This line was located 180m north of the study area, with the Penrith Railway Station also established to the north, outside of the study area.

During the 1880s and 1890s, the study area and surrounds were subdivided into smaller allotments to accommodate tenant farmers, shopkeepers, mechanics and labourers. This marks the first known development in the study area. A subdivision plan from c.1880 shows no evidence of development on

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Station Street between Henry Street and High Street (within the study area) by the late 1880s (Figure 6). However, it indicates that five small structures, most likely shops, were either present or intended to be located along Henry Street within in the north-western portion of the study area. Records indicate that by 1886, structures in the north-west corner of the study area are likely to have included a livery, stables and residence established by William Ransley in 1886 and eventually run by John and Louisa Priddle until the 1920s. The Priddles also established a blacksmiths shop and lolly shop on the property in the late 1880s. The establishment of the Priddle businesses in the northwest portion of the study area may have required the demolition/modification of earlier Henry Street shops, however there is not sufficient cartographic evidence available to confirm this.

The c.1880 plan also shows development along High Street to the south of the study area which is explicitly named as 'stores' or 'shops'. Outbuildings associated with these stores and shops may have extended into the southern portion of the study area at this time, though these would not have been included in subdivision plans. An aerial photograph taken in 1943 (Figure 9) does however confirm the presence of outbuildings within the southern portion of the study area. The location and configuration of these buildings suggests they represent development associated with High Street shops shown in Figure 6.

Potential archaeological remains from this land use phase may include evidence of drains, the Ransley/Priddle blacksmith's shop, livery stables/residence and lolly shop, including building footings and foundations, undocumented subsurface features such as cisterns, wells or cesspits and potential subsurface deposits associated with the businesses. Archaeological remains of the outbuildings associated with the High Street businesses may include building footings and undocumented subsurface features, such as cisterns, wells or cesspits, as well as yard scatters and postholes associated with the large yard spaces in the southern portion of the study area. There is potential for artefact-bearing deposits to be present within any undocumented subsurface features.

6.1.3 Phase 3: Early Twentieth Century Commercial Development (c1900 – c.1950)

Phase 3 is defined by the large-scale growth of the study area and surrounds into a commercial centre.

This included the State Boot Manufacturing Company located on the corner of Station and High Streets, a Commonwealth Employment Office at 505 High Street (1930s-1950s), a dry cleaners and dyers at 503 High St (1930-1950s), a hardware, crockery and appliance store at 499 High Street, and Handleys Home Appliance specialists (1940-1950s).

Outbuildings associated with the High Street businesses (shown in Figure 9) were demolished during the construction of the Allen Place carparking area in the 1960s.

A historical aerial photograph from 1943 (Figure 9) shows three large structures and four smaller outbuildings within the north-western portion of the study area, on land associated with the Ransley/Priddle blacksmiths shop and livery stables/residence (now run by Nelson Price). These structures may have been constructed on the site during Phase 2 in association with the livery stables, blacksmith and lolly shop activities on the site, or constructed during ongoing use of the site during Phase 3. Archaeological remains from these buildings may have been impacted by the construction of the John Price & Son funeral home during the subsequent land-use phase (Phase 4). As the extent of excavation undertaken during the construction of the funeral home is not known, the extent of these impacts is unknown.

6.1.4 Phase 4: Post-War Demolitions and Redevelopment (c1950-present)

Phase 3 is defined by the demolition of all Pre-War structures within the study area and large-scale Post-War redevelopment.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

A comparison of historical imagery from c1940s and mid-late twentieth century imagery indicates that the majority of the structures in and around the study area at that time were demolished by the late 1950s-c1960s. The study area was entirely redeveloped with Post-War architecture including commercial premises and the John Price & Son funeral home. This funeral home was constructed in 1954, requiring the demolition of the Ransley/Priddle/Price livery stables/residence and blacksmith's shop that previously occupied the north-western portion of the study area. As no basement was part of the site, it is likely that minimal excavation took place during the construction of the funeral home and archaeological remains of the livery stables/residence and blacksmith's shop may be present. It is unknown whether the surrounding commercial premises have basement areas, though this is unlikely.

The Allen Place carpark in the southern and eastern portions of the study area was in place from 1962, with a multi-storey carpark and overpass developed during the c1980s. The multi-storey carpark was demolished by 2017, with a ground level car parking facility remaining.

Potential archaeological remains from this land use phase include demolition fill from the Pre-War structures.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figure 40. Known historical structures from Phases 2 and 3, using information taken from the 1888 subdivision plan and 1943 aerial of the study area. The Phase 2 outbuildings are undocumented; thus, the approximate area of these outbuildings is also included.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.2 Known disturbance

As described in Section 2.3, ongoing land use and development have the potential to disturb, remove or truncate archaeological evidence of past occupation phases. The known disturbances to the study area include the larger scale demolitions of Pre-War structures (Phase 2) in the c1950s-1960s and the 1962 car parking development (Phase 4) in the southern portion of the study area.

These developments would have cleared the study area of all Phase 2 and some Phase 3 buildings including the Ransley/Priddle/Price stables, livery, blackmith's shop and residence and Louisa Paddle's lolly shop. All Phase 2 outbuildings along the southern boundary of the study area (formerly associated with the High Street shops) were also cleared as part of these later developments. The laneway that ran between Henry and High Street also appears to have been modified or replaced by modern road corridors during Phase 4 occupation.

Although the extent of subsurface impacts associated with Phase 4 development is not known, it would have required some localised excavation and levelling to prepare the site for new buildings and utilities. However, no Phase 4 structures in the study area contain basements, suggesting no extensive excavation took place at this time. The construction of a multistorey parking facility, overpass and support structures in 1962 may have required shallow excavations for levelling as well as localised excavations for piles. It did not contain a basement level. The parking facility was demolished in 2017, with a single-level car park remaining in place.

These major impacts, especially to the southern portion of the study area, may have resulted in numerous localised impacts to potential archaeological remains associated with earlier land use phases. However, structural evidence of former buildings such as footing and foundations may survive, in addition to deep features such as cesspits and wells.

6.3 Assessment of archaeological potential

6.3.1 Phase 1: Early Land Grants (1789 – c1850)

Potential archaeological remains from this land use phase may include evidence of land clearing and agricultural/pastoral practices such as postholes demonstrating the location of former fence lines and tree boles. It is highly unlikely that any intact archaeological evidence of Phase 1 would be present within the study area. There is no evidence to suggest that any structures were present in the study area during this land use phase.

Development of the study area during subsequent phases, including the demolition of structures and redevelopment during the Post-War period, is likely to have significantly disturbed any potential archaeological remains from this phase. Therefore, there is **nil** archaeological potential for archaeological remains from Phase 1, including evidence of early land clearing such as postholes or tree boles.

There is nil potential for archaeological remains associated with Phase 1 to be present within the study area.

6.3.2 Phase 2: Nineteenth Century Commercial Development (c1850 – c1900)

Potential archaeological remains association with Phase 2 occupation may include evidence of the 1888 Henry Street shops, located in the northern portion of the study area. These comprise primarily of the Ransley/Priddle livery stables/residence, blacksmith's shop and lolly shop, which were run by Nelson Price from 1908 onwards. These remains may consist of drains, building footings and foundations, yard scatters, rubbish pits and undocumented subsurface structures such as cisterns, wells or cesspits. It is possible that deeper subsurface structures, like cesspits, wells or cisterns, may contain artefact-bearing deposits.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

In the southern portion of the study area, archaeological evidence of the c.1880s outbuildings associated with the High Street businesses may be present. These would include building footings and undocumented subsurface features, as well as yard scatters, rubbish pits and postholes associated with the large yard spaces.

The construction of the 1954 John Price & Son funeral home is likely to have impacted to a certain extent any archaeological remains in the north-western portion of the study area, with the Priddle/Price livery stables/residence and blacksmith's shop demolished and the site levelled. As no excavation for a basement took place during the funeral home's construction, it is likely that remains of building footings and deeper subsurface features have survived while surface features such as rubbish pits and yard scatters were removed or disturbed. Therefore, there is **moderate** potential for archaeological remains such as building foundations, footings and deeper subsurface features such as cisterns, cesspits or wells associated with the Price/Priddle businesses to be located in the north-western portion of the study area.

The construction of the Allen Place car parking facility in 1962 and subsequent expansion into a multistorey carpark in the 1980s are likely to have majorly impacted archaeological evidence in the southern portion of the study area. The construction would have involved large-scale levelling, with some excavation for supports likely to have been installed in the 1980s multistorey car park. Further excavation for the carp park, and its impacts on the archaeological resource, is unknown. As no subterranean levels exist in the car park, impacts may be localised and subsurface features may have survived. Therefore, there is **low** potential for remains of footings or foundations associated with the High Street outbuildings and undocumented subsurface structures such as cisterns.

There is moderate potential for archaeological remains associated with Phase 2 to be present within the north-western portion of the study area, and low potential for archaeological remains associated with Phase 2 to be present within the southern portion of the study area.

6.3.3 Phase 3: Early Twentieth Century Commercial Development (c1900 – c1950)

Archaeological remains associated with Phase 3 land use would primarily be associated with the ongoing use and modification of Phase 2 shops, residences and outbuildings in the study area. Evidence of these activities may have been disturbed or removed for construction activities associated with Phase 4 development, as discussed in Section 6.3.2 above. However, there is potential for structural and deep subsurface evidence of this occupation to survive.

There is moderate potential for archaeological remains associated with Phase 3 to be present within the north-western portion of the study area, and low potential for archaeological remains associated with Phase 3 to be present within the southern portion of the study area.

6.3.4 Phase 4: Post-War Demolitions and Redevelopment (c1950-present)

The construction activities occurring in Phase 4 are likely to have majorly impacted archaeological evidence from previous phases of occupation, notably the Allen Place carpark and the John Price & Son funeral home. Potential archaeological remains associated with Phase 4 would be limited to demolition fills associated with the Post-War redevelopment. This includes the demolition of the Priddle/Price livery stables/residence and blacksmith's shop in the north-western portion of the study area and the demolition of the outbuildings associated with the High Street shops.

There is moderate potential for archaeological remains associated with Phase 4 to be present within the study area.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

6.4 Assessment of archaeological significance

This section assesses the heritage significance of the known or potential archaeological remains outlined in Section 6.2. Similar to other types of heritage items, archaeological remains should be managed in accordance with their significance. Assessing the heritage value of archaeological remains is complicated by the fact that their extent and nature is often unknown. Judgement must therefore be based on expected or potential attributes.

The significance of the potential archaeological resource has been assessed using the NSW heritage assessment criteria and is outlined in Table 5.

Table 5. Assessment of archaeological significance against the NSW Heritage assessment criteria

Criterion	Discussion
A) Historical	Any intact archaeological remains identified at the property have the potential to contribute to our understanding of the early development of the Penrith business district and its evolution from a farming landscape to a commercial centre. Archaeological resources associated with Phase 1 would contribute to our knowledge about early farming Penrith, though remains associated with Phase 1 are unlikely to be located within the study area. Nineteenth-century building footings, undocumented subsurface features, remains of outbuildings associated with Phase 2 and evidence of continued use/modification during Phase 3 have potential to contribute to the knowledge of building materials and construction techniques in use in Penrith at the time, which was originally located at a considerable distance from the township of Sydney and its readily available building materials and craftsmen. Early twentieth century building footings and remains of outbuildings from Phase 3 may show the development of building techniques in Penrith as it became wealthier and more connected to Sydney via the railway. Artefact bearing deposits found in yard scatters, rubbish pits or undocumented cesspits, cisterns or wells have potential to contribute to our knowledge about the early residents and businesses in the study area. These deposits could be associated with the Phase 2 Henry Street shops and High Street outbuildings, as well as the Phase 2 Price/Priddle business and High Street outbuildings. It is likely that artefact-bearing deposits will date from the late nineteenth to mid-twentieth century, when Penrith was undergoing rapid development. If found to be intact, archaeological remains associated Phase 2 and ongoing use of those structures during Phase 3 have the potential to reach the **local** significance threshold under this criterion. Archaeological evidence associated with Phase 3 and Phase 4 development of the study area is unlikely to reach the local significance threshold. The demolition and subsequent redevelopment of the Penrith commercial district is well documented, and archaeological evidence is unlikely to further contribute to knowledge of the Post-War history of the area.
B) Associative	Archaeological remains of the Phase 2 livery stables/blacksmiths shop within the study area would be associated business owners and residents of Penrith, particularly the Price and Priddle families. The Priddles were a well-known family in business in Penrith during the nineteenth century, while the Prices were associated with John Price & Son, a funeral business that had operated out of Penrith since 1855. Archaeological evidence associated with the businesses and activities of the Priddle and Price families has the potential to reach the **local** significance threshold under this criterion.
C) Aesthetic or Technical	Archaeological remains have the potential to be intact and highly legible. These remains may have distinctive/attractive visual qualities, that are considered to be 'important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW.' Potential archaeological remains including nineteenth century

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Criterion	Discussion
	building footings, undocumented structures, cisterns, wells or rubbish pits and the livery stables/blacksmith's shop in Phase 2 and evidence of continued use/modification of those structures during Phase 3 would represent building techniques and farming practices in the nineteenth and early twentieth century but would be unlikely to demonstrate any outstanding aesthetic or technical achievement. Artefact bearing deposits found in yard scatters, rubbish pits or undocumented cesspits, cisterns or wells may contribute to the knowledge of the activities conducted in the area, such as the livery stables/residence or blacksmith's shop from Phase 2 but are unlikely to possess any aesthetic or technical merit. Archaeological evidence is unlikely to reach the local significance threshold under this criterion.
D) Social	Potential archaeological remains associated with the early development of the study area are likely to have social significance amongst members of the surrounding community, as well as individuals or associations such as historical societies interested in the nineteenth century development of Penrith. Archaeological remains associated with Phase 2 showing the nineteenth century expansion of Penrith have the potential to reach the **local** significance threshold under this criterion.
E) Research Potential	The study area has the potential to contain artefact-bearing deposits associated with the outbuildings from Phase 2 and 3 and the livery stables/blacksmith's shop from Phase 2. Archaeological analysis of deposits of this type can recover data that may be utilised in the analysis of business owners and working families in the nineteenth and early twentieth century. This is especially pertinent to the livery stables/residence, as a known dwelling in the study area. Artefacts from these deposits have the potential to provide information relating to the taste, function, and habits of these classes, which are typically under-represented in the historical record. Potential intact archaeological remains, especially intact artefact bearing deposits associated with the occupation of the study area in Phase 2 would reach the **local** significance threshold under this criterion. It is unlikely that remains of the Phase 4 Post-War demolition and redevelopment would provide any new information about construction techniques in the twentieth century, a topic that is already well documented and extant. It is also unlikely that nineteenth century building remains or subsurface features would offer further knowledge concerning Victorian construction techniques. Archaeological evidence of this type would not reach the local significance threshold.
F) Rarity	There is no evidence to suggest archaeological remains associated with occupation within the study area would be considered unusual or unique. Artefact-bearing deposits from the nineteenth and early twentieth century and the artefacts they contain tend to be of standard types and are well-represented in the archaeological record. Though Penrith was located a great distance from Sydney in the late eighteenth and early nineteenth century and may have developed unique construction techniques or materials during this time, it is unlikely that these would be demonstrated through demolition fills, building footings or undocumented subsurface structures, all standard features of colonial architecture. Archaeological evidence is unlikely to reach the local significance threshold under this criterion.
G) Representativeness	It is expected that potential archaeological remains, including sandstone or brick footings of outbuildings associated with Phase 2 and Phase 3 would be representative of Victorian era commercial structures and that potential artefact bearing deposits would contain somewhat typical artefacts, including glass, metal and ceramic artefacts. If found to be intact, archaeological remains associated with the nineteenth century development of Penrith have the potential to reach the **local** significance threshold under this criterion.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Criterion	Discussion
	Though archaeological remains of the Post-War demolition and redevelopment would be representative of mid-twentieth century commercial expansion in the Penrith region, archaeological remains from this period are unlikely to be fine examples of their type. Archaeological evidence of this type is unlikely to reach the local significance threshold under this criterion.

6.5 Statement of archaeological significance

Residential occupation of the site by the Priddle family occurred between 1888 and 1908. As the residence was established prior to the introduction of municipal stormwater and waste removal services starting in 1890, the study area has the potential to contain artefact-bearing deposits associated with discard practises (i.e. within rubbish pits and/or artefact scatters incorporated into yard surfaces) and opportunistic discard within abandoned wells, cisterns and/or privies/cesspits.

Should artefact-rich soil deposits be identified, based on archaeological results obtained from similar sites, analysis is likely to provide data which can contribute to our understanding of the preferences, socio-economic standing, gender and ethnicity of the occupants of the site. Artefacts obtained from the secure deposits therefore have the ability to respond to research agendas and provide useful information regarding the former occupants of the site. As the residential history of the study area is well documented, remains have the potential to be directly associated with the Priddle family, who contributed to the early development of Penrith.

The study area, therefore, has the potential to contain archaeological 'relics,' as protected by relic provisions of the *Heritage Act 1977* in the form of artefact-bearing deposits associated with the occupation of the study area by the Priddle family between 1888-1908.

6.6 Summary of archaeological potential and significance

Overall, portions of the study area have **low-moderate** potential to contain an archaeological resource associated with Phase 2 occupation and continued use in Phase 3 that would reach the local significance threshold and be considered 'relics' under the Heritage Act (amended 2009) (see Section 3.3.3 and Figure 40).

The north-western portion of the study area has **moderate** potential to contain remains associated with the Phase 2 Ransley/ Priddle/Price livery stables/residence, lolly shop and blacksmith's shop and ongoing use of these buildings during Phase 3 occupation.

The southern portion of the study area is likely to have been subject to varying levels of disturbance associated with the extensive car parking facilities established in the 1960s and modified in the 1980s and 2017. This portion has **low** potential to contain archaeological resources associated with Phase 2 development (outbuildings) and ongoing use of this development during Phase 3 occupation.

A summary of the archaeological potential and significance of the study area is outlined in Table 6. A map showing the areas of archaeological potential within the study area is provided in Figure 41.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Table 6: Overview of archaeological potential and significance

Phase	Potential remains	Potential	Significance
Phase 1: Early Land Grants (1789 – c1850)	Postholes demonstrating the location of former fence lines Evidence of land clearance (tree boles)	Nil Nil	Local (if present and intact)
Phase 2: Nineteenth Century Commercial Development (c1850 – c1900)	Documented building foundations and footings associated with the Ransley/Price/Priddle livery stables/residence/blacksmith's shop and additional c1880 Henry Street shops Undocumented subsurface features i.e., drains, basements, cesspits, cisterns and wells associated with the Price/Priddle livery stables/residence/blacksmith's shop Building foundations and footings associated with the High Street outbuildings Undocumented subsurface features i.e., basements, cesspits, cisterns and wells associated with the High Street outbuildings In situ artefact bearing deposits	Moderate Moderate Low Low	Local (relics)
Phase 3: Early Twentieth Century Commercial Development (c1900 – c1950)	Ongoing use of the Ransley/Price/Priddle livery stables/residence/blacksmith's shop Ongoing use of undocumented subsurface features i.e., basements, cesspits, cisterns and wells associated with the Price/Priddle livery stables/residence/blacksmith's shop Ongoing use of building foundations and footings associated with the High Street outbuildings Ongoing use of undocumented subsurface features i.e., basements, cesspits, cisterns and wells associated with the High Street outbuildings	Moderate Moderate Low Low	Local (ongoing use of Phase 2 buildings only) Not significant (all post-Phase 2 development)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Phase	Potential remains	Potential	Significance
Phase 3: Post-War Demolitions and Redevelopment (c1950 – present)	Demolition fills associated with Post-War redevelopment	Moderate	Not significant

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

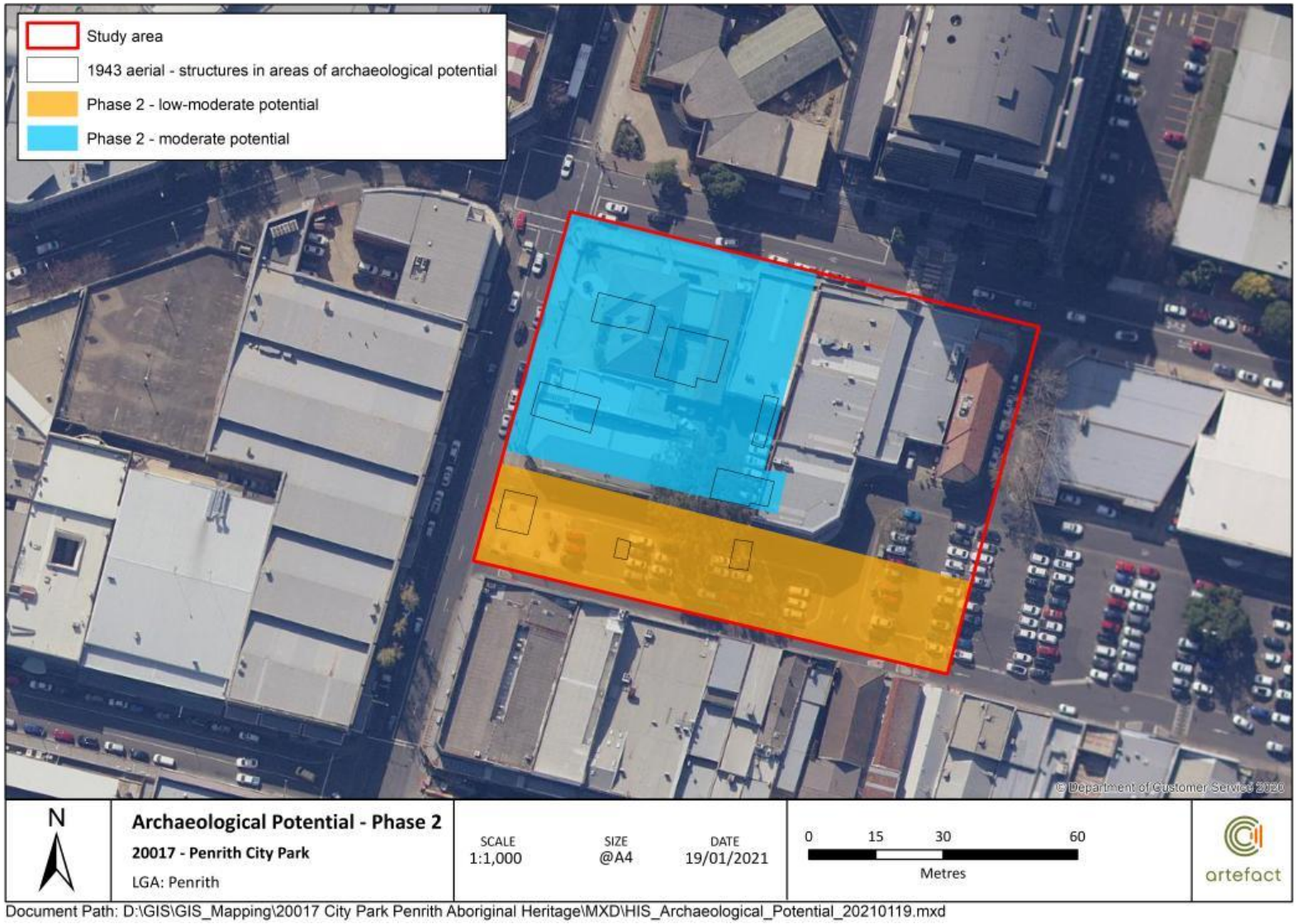

Figure 41. Phase 2 archaeological potential for the study area

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.0 BUILT HERITAGE ASSESSMENT

7.1 Assessment of significance

This section contains the descriptions, significance assessments and statements of significance for the listed and unlisted heritage items within and around the study area. The significance assessment and statement of significance for all listed items has been extracted from the relevant SHI entry for each item.

7.1.1 Penrith Council Chambers (former) (Penrith LEP 2010 Item No. 189)

7.1.1.1 Description

Constructed from 1959 and designed by A. Hodgson in the Inter-War Moderne / Functionalist style of architecture, the former Penrith City Council chambers features a central double storey reception hall with a figurative decorative terrazzo floor incorporating the council's coat of arms. The building comprises red brick with a textured surface, steel framed windows and doors and a roof hidden behind a parapet. The main entrance is set back from the street, behind a landscaped forecourt with water feature. Internally, the structure features meeting halls and offices, whilst a caretakers flat / office on the eastern wing was a later addition.

7.1.1.2 Assessment of significance

The assessment of significance for the Penrith Council Chambers (former) item (Penrith LEP 2010 Item No. 189) is shown below.

Table 7. Assessment of significance against the NSW Heritage assessment criteria

Criterion	Discussion
A) Historical	*The building demonstrates a phase in the development of the Nepean region following the amalgamation of numerous rural councils. The completion of the building coincides with the incorporation of Penrith City Council in 1959 and marked a return to a form of centralised government on which Penrith had been founded in the early nineteenth century.*
B) Associative	*This item does not reach the local significance threshold under this criterion.*
C) Aesthetic or Technical	*The building is an example of the inter-war Moderne /Functionalist style of architecture set within a landscaped forecourt.*
D) Social	*This item does not reach the local significance threshold under this criterion.*
E) Research Potential	*This item does not reach the local significance threshold under this criterion.*
F) Rarity	*The building was the first chambers of the newly incorporated City of Penrith Council, and formed the focus for the planning and administration of post war expansion in the Nepean region. The scale and style of the building is unique in the LGA.*
G) Representativeness	*The building is representative of a style of architecture developed and popularised in the 1930s and early 1940s.*

7.1.1.3 Statement of significance

The statement of significance for the Penrith Council Chambers (former) item (Penrith LEP 2010 Item No. 189) is as follows:

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

The former Penrith City Council chambers, completed in 1959, was the first chambers of the newly incorporated City of Penrith Council, and formed the focus for the planning and administration of Post-War expansion in the Nepean region. The former chambers demonstrate a phase in the development of the Nepean region following the amalgamation of numerous rural councils and marked a return to a form of centralised government on which Penrith had been founded in the early nineteenth century. The building is an example of the Inter-War Moderne / Functionalist style of architecture set within a landscaped forecourt.[49][50]

7.1.2 TAFE Building (Penrith LEP 2010 Item No. 689)

7.1.2.1 Description

The TAFE Building was designed by E.H. Farmer (NSW Government Architect) and opened on 5 June 1961. The structure is a two-storey building with reinforced concrete frame, stoned coursed wall treatment and aluminium framed glazed walls. It comprises a public foyer with reinforced concrete staircase and is set back slightly from the street behind a narrow, landscaped courtyard and low brick wall. In addition, the low-lying nature of the building is accentuated by the strongly defined horizontal roof line.

7.1.2.2 Assessment of significance

The assessment of significance for the for the TAFE Building item (Penrith LEP 2010 Item No. 689) is shown below.

Table 8. Assessment of significance against the NSW Heritage assessment criteria

Criterion	Discussion
A) Historical	*The building demonstrates a phase in the development of the Nepean region following the amalgamation of numerous rural councils. The completion of the building coincides with the incorporation of Penrith City Council in 1959 and marked upgrade of government services following the County Cumberland Plan of 1955. The role of the building in providing instruction in trades and services coincides with the importance of Penrith as a place of industry.*
B) Associative	*This item does not reach the local significance threshold under this criterion.*
C) Aesthetic or Technical	*The building is an excellent example of the International style of architecture favoured by the NSW Government Architect at the time.*
D) Social	*This item does not reach the local significance threshold under this criterion.*
E) Research Potential	*This item does not reach the local significance threshold under this criterion.*
F) Rarity	*The building in its role and architectural design is unique in Penrith LGA.*
G) Representativeness	*The building is representative of the output of the NSW Government Architect.*

[49] Office of Environment and Heritage, 2005. 'Penrith Council Chambers (former)'. Accessed online December 2020: https://apps.environment.nsw.gov.au/dpcheritageapp/ViewHeritageItemDetails.aspx?ID=2260189

[50] 'It is noted that the Penrith Former Council Chambers site is currently under investigation to establish the redevelopment potential of the site, including progressing through an Architectural Design Excellence Competition process. Any proposed changes to the Former Council Chambers building will be subject to a thorough merit based assessment, including further heritage impact assessment' (Penrith Council, *pers comm* 27 January 2021)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.1.2.3 Statement of significance

The statement of significance for the TAFE Building item (Penrith LEP 2010 Item No. 689) is as follows:

> *The TAFE Building is one of the first post-1960s modern civic buildings erected in Penrith designed in the International architectural style, at the onset of the growth of the town into a regional city. The building is an excellent example of the work of the NSW Government Architect (E. H. Farmer) at the time and is rare within the LGA. The building is located within a precinct of former centres of local and county levels of government administration, this building demonstrating a layer of State Government administration. The role of the building in providing instruction in trades and services coincides with the importance of Penrith as a place of industry.*[51]

7.1.3 Prospect Electricity Building (former) (Penrith LEP 2010 Item No. 701)

7.1.3.1 Description

The former Prospect Electricity Building was designed by Leslie J Buckland and Druce in the c1960s. The structure is a three-storey office block at the corner of Station and Henry Streets, Penrith, directly opposite the former Penrith City Council Chambers. It comprises reinforced concrete with expressed grid posts and beams with glazed panelled infill. The lower and upper areas of the façade have been altered.

7.1.3.2 Assessment of significance

The assessment of significance for the former Prospect Electricity Building item (Penrith LEP 2010 Item No. 701) is shown below.

Table 9. Assessment of significance against the NSW Heritage assessment criteria

Criterion	Discussion
A) Historical	*The building demonstrates a phase in the development of the Penrith with the formation of regional electricity supply. The completion of the building coincides with the marked upgrade of government services following the County Cumberland Plan of 1955 and the onset of Penrith's accelerated industrial, commercial and residential development of the 1960s.*
B) Associative	*This item does not reach the local significance threshold under this criterion.*
C) Aesthetic or Technical	*The building is a representative example of the International style of architecture. The façade of the building contributes to the townscape values of Penrith CBD.*
D) Social	*This item does not reach the local significance threshold under this criterion.*
E) Research Potential	*This item does not reach the local significance threshold under this criterion.*
F) Rarity	*The building in its role, scale and architectural design is unique in Penrith LGA.*
G) Representativeness	*This item does not reach the local significance threshold under this criterion.*

[51] Office of Environment and Heritage, 2005. 'TAFE Building'. Accessed online December 2020: https://apps.environment.nsw.gov.au/dpcheritageapp/ViewHeritageItemDetails.aspx?ID=2260689

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.1.3.3 Statement of significance

The statement of significance for the former Prospect Electricity Building item (Penrith LEP 2010 Item No. 701) is as follows:

> *The former Prospect Electricity Building is a post-1960 modern civic building erected in Penrith and exemplifies the growth of the town into a regional city. The building is a representative example of the International style of architecture which is unique in the Penrith LGA. The building is located opposite the former Penrith Council Chambers and the pair form a precinct of former centres of local and county levels of government administration.*[52]

7.1.4 John Price & Son Funeral Home (former) (unlisted potential heritage item)

7.1.4.1 Description

The former John Price & Son funeral home was built by William Frederick Smith in c1954, beginning operations in November of that year. The structure is a single-storey Flemish bond brick Post-War structure with ornamental brick detailing. A courtyard-style parking bay is positioned in the rear yard of the property.

The Station Street elevation comprises a double-faced Flemish bond brick façade with double hipped roof constructed with terracotta-coloured tiles. Two double-hung timber sash dormer windows are positioned on the southern portion of the roof, with a single timber bay window and three double-hung sash windows on the ground floor. Two bow windows flank the glass front doors, with a single ornamental brick diamond set between the doors and the northern bow window. Further ornamental brick detailing in a triangular design is present underneath the bay window.

The Henry Street elevation comprises a single-faced Flemish bond brick facade with two attached garages on the northern end; the northernmost garage extends to the rear of the property and features a sloped terracotta tile roof, while the second garage extends approximately 5m to the rear of the property and features a flat corrugated iron roof. One narrow and one wide timber double-hung sash window are positioned on the southern end of the elevation, with two unusual pointed-arch stained glass windows flanking the wooden double doors. The windows, which indicate the presence of an interior chapel, are made of red and yellow stained glass and feature a stylised cross design.

Internally, the building is in good condition and appears to substantially retain internal features such as cornices, window fittings and finishes. Floorboards are the main flooring throughout the building, with minor areas of damage evident in the front parlour. It is likely that the utilitarian interior design of the building remains true to its original form and operation. Light fittings appeared to post-date the construction of the building.

The structure is set slightly back from the street with a low brick wall with ornamental detailing and crushed-gravel courtyard. An unusual brick fountain with an octagonal brick base is positioned in front of the Station Street entrance.

[52] Office of Environment and Heritage, 2005. 'Prospect Electricity Building'. Accessed online December 2020: https://apps.environment.nsw.gov.au/dpcheritageapp/ViewHeritageItemDetails.aspx?ID=2260701

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figure 42. View of Station Street elevation of the former John Price & Son funeral home. (Source: Google Maps)

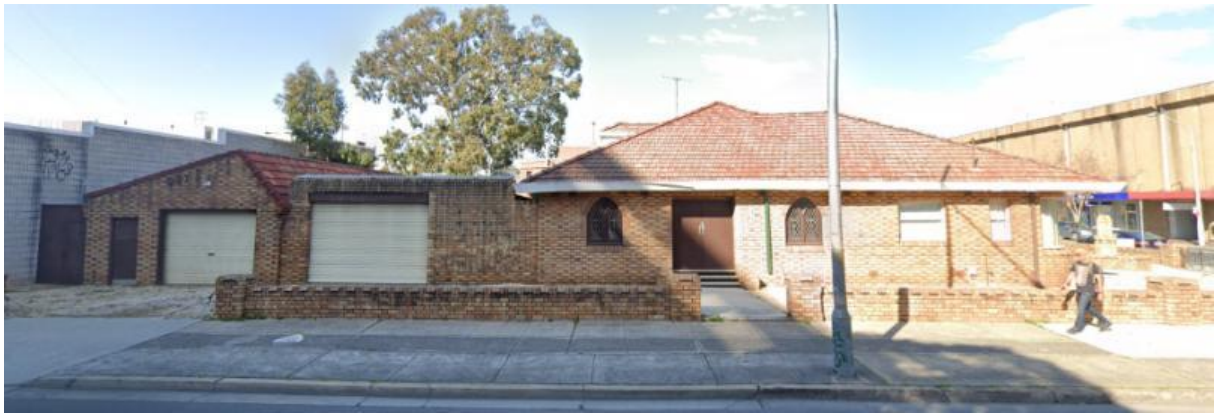

Figure 43. View of the Henry Street elevation of the former John Price & Son funeral home. (Source: Google Maps)

Figure 44. View of the octagonal brick fountain in the Station Street courtyard of the former Price & Son funeral home. (Source: JMD Design)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.1.4.2 Assessment of significance

The following assessment of significance of the 'John Price & Son funeral home (former)' unlisted heritage item is based on historical research and a site inspection and is presented in Table 10 below.

Table 10: Significance assessment for 'John Price & Son funeral home (former)'

Criterion	Explanation
A – Historical Significance	The former funeral home has historical significance at a local level. John Price & Son is historically associated with the development of Penrith and the local area's funeral industry. The building, constructed 100 years after the founding of the Price & Son business, shows the growth of funerary practices and customs in the area. The building represents the Post-War evolution of Penrith's commercial district. The long-term occupation of the building by John Price & Son and its continuous use as a funeral home is rare in the Penrith area, with many buildings surrounding the study area dated to the late twentieth century. The importance of the funeral home and its role in the evolution of Perth's commercial district during the twentieth century contributes to its historical significance. The item has **local** significance under this criterion.
B – Associative Significance	The former funeral home is associated with John Price & Son, a local funeral business that has operated in the Penrith area for over 150 years. Moving from its original position in High Street to the current property in the 1950s, the structure was purpose-built for local funerals arranged by John Price & Son until 2014. This long association with a single business is of great significance to the local community. The item has **local** significance under this criterion.
C – Aesthetic or Technical Significance	The former funeral home displays a high level of aesthetic significance, with an eclectic mixture of architectural features from a number of period styles including Post-War, Interwar, Art Deco and Federation. The building's purpose as a funeral home is indicated by aspects of religious architecture to the chapel, including pointed-arch stained glass windows with stylised cross elements. The structure is constructed in multi-coloured "Chromatex" brick, including moulded and curved varieties, which were a new and popular material at the time. Both externally and internally the building appears to be substantially intact, with the relatively modest interiors indicative of the restrained and utilitarian nature of the space excepting the chapel room. A highly unusual octagonal brick fountain in the Station Street courtyard is contributory to the item's aesthetic significance. The item has **local** significance under this criterion.
D – Social Significance	The former funeral home has the potential to contribute to the local community's sense of place and can provide a connection to the local community's past. As a locally-recognised name in the funerary industry, John Price & Son has conducted the funerals of local residents since its establishment in 1855. The business operated within this purpose-built funeral home from 1954-2014. A strong association is present between the structure, the business, residents of the local area and other stakeholders such as local historical societies. The item has **local** significance under this criterion.
E – Research Potential	The former funeral home is unlikely to provide further knowledge about funerary techniques or practices in the twentieth century; this topic is already well-documented in the historical record. The item does not meet the threshold for significance under this criterion.
F – Rarity	The unusual combination of architectural styles present within the structure are unique for a Post-War building. The bay and dormer style windows are reminiscent of earlier Federation/Interwar style architecture, while the pointed-arch stained glass windows are more typical of religious buildings. These window styles, combined with a highly

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Criterion	Explanation
	ornamental “Chromatex” brick and Flemish bond, produce a rare and eclectic building that is highly contributory to the streetscape. The item has **local** significance under this criterion.
G – Representativeness	The former funeral home is representative of the increasing professionalisation of funerary practices in Australia following the Second World War, as funerals moved away from the domestic sphere and became a recognised industry. The item has **local** significance under this criterion.

7.1.4.3 Statement of significance

The former John Price & Son funeral home is of local heritage significance.

The funeral home, completed in 1954, is the oldest continuously-used purpose-built funeral home in Penrith, showing the changing attitudes towards funerary practices and customs in the area. The funeral home is associated with a local funeral business founded by John Price in Penrith in 1855, which moved from High Street to its current location in the 1950s. The Post-War building features an eclectic mixture of architectural styles, including Interwar, Art Deco and Federation features such as bay and dormer windows. The religious aspect of funerals is also shown in the religious architectural features of the Station Street elevation, which include pointed-arch stained glass windows with stylised cross elements. This combination of architectural styles makes the building unique in the Penrith LGA and a distinctive item in the streetscape. A highly unusual octagonal brick fountain in the Station Street courtyard is contributory to the item’s aesthetic significance.

7.1.4.4 Grading of heritage significance

The different elements of a structure or place contribute to its overall heritage value. The loss of one or more of these components may diminish the overall significance of the item. Specifying the contribution that a component makes to the overall heritage significance of a structure or place provides a useful framework for its management.

The NSW Heritage Office’s publication *Assessing Heritage Significance* (2001) outlines appropriate terminology and justification for grading individual components, and the implications that this grading has to an item or landscape’s significance (Table 11).

Table 11. Standard grades of significance.

Grading	Justification	Status
Exceptional (E)	Rare or outstanding element directly contributing to an item’s local and State significance.	Fulfils criteria for Local or State listing.
High (H)	High degree of original fabric. Demonstrates a key element of the item’s significance. Alterations do not detract from significance.	Fulfils criteria for Local or State listing.
Moderate (M)	Altered or modified elements. Elements with little heritage value, but which contribute to the overall significance of the item.	Fulfils criteria for Local or State listing.
Little (L)	Alterations detract from significance. Difficult to interpret.	Does not fulfil criteria for Local or State listing.
Intrusive (I)	Damaging to the item’s heritage significance.	Does not fulfil criteria for Local or State listing.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.1.4.4.1 John Price & Son funeral home grading of significance - exterior

Table 12: Heritage significant fabric at former John Price & Son funeral home - Exterior

Area	Element/ Significance of fabric	Image
Roof and high-level elements	Terracotta tiles – High Timber and steel roof structure (assumed) – High Timber fascia and eaves – Moderate Windows (dormer) – High Aerials - little	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Area	Element/ Significance of fabric	Image
External Walls	Chromatex brick – High Doors (front and French doors) - Moderate Windows (Bay, dormer and bow) – High	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Area	Element/ Significance of fabric	Image
	Chromatex Brick – High Doors - High Windows (Stained glass, sash and bow) – High Garage and outbuilding - High	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Area	Element/ Significance of fabric	Image
	Chromatex Brick – High Doors - High Windows – Moderate Garage and outbuilding – High Rear courtyard - Moderate	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Area	Element/ Significance of fabric	Image
Courtyard and landscaping – Ground floor	Concrete (ground floor)– Little Brick fence – High Iron gate - High Brick columns - Moderate Octagonal fountain – High	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

7.1.4.4.2 John Price & Son funeral home grading of significance - interior

Table 13: Significant fabric located at former John Price & Son funeral home - Interior

Area	Element/ Significance of fabric	Image
Chapel	Ceiling -Little Cornices - Little Walls – High Timber turned columns - High Wooden flooring- Moderate Carpet flooring - Little Skirting boards - Little Stained glass windows - High Light fittings - Little	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Area	Element/ Significance of fabric	Image
Residence	Ceiling -Little Cornices - Little Walls - High Wooden flooring- Moderate Skirting boards - Little Timber sash window, bay window, dormer window – High Blinds and curtains - Little Light fixtures – Little	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Area	Element/ Significance of fabric	Image
Outbuildings	Ceiling -Little Walls - Moderate Tile and concrete flooring- Little Timber sash windows – High Built-in cupboards and storage – Little Light fixtures – Little	

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.0 IMPACT ASSESSMENT

8.1 Introduction

The following section provides an assessment of the impacts that proposed development will have on heritage listed items, one unlisted item and potential archaeological remains within and around the study area.

This assessment has been prepared in accordance with the guidelines provided by the NSW Heritage Council and seeks to evaluate and explain how the proposed works may impact the heritage significance of the place, and comment on the necessity of negative impacts and mitigation measures (see Section 2.4).

8.2 Proposal

Council has proposed to establish a City Park at the corner of Station Street and Henry Street, Penrith. The City Park will be a vibrant green space that is a destination for residents, workers and visitors and a stimulant for the day- and night-time economy of the area. The proposal would involve the demolition of all existing structures within the study area and remediation of the site.

The properties affected by the proposal are:

- Lot 3 DP 1200790
- Lot 1 DP 526304
- Lot E DP 163176
- Lot 2 DP 556075
- Lot 10 DP 5536655
- Lot 11 DP 5536655
- Lot 1 DP 164798
- Lot 1 DP 252457
- Lot 1 DP 254763.

Key features of the proposal include the following:

- Demolition of all existing structures within the study area
- Remediation of the study area and earthworks
- Construction and re-surfacing of the impacted road pavement
- Installation of an irrigated central lawn
- Installation of WSUD, upgrade kerb and gutters
- Recycled brick paving
- Landscaping including the planting of super advanced trees and mass planting
- Installation of smart park elements
- Waste innovation (for properties adjacent to the park)
- Installation of custom designed amenities building with storage, a performance space and pergola

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

- Design and installation of sustainable water feature (or water features) with interactive elements
- Public art
- Quality and durable fixtures, fittings, and furniture (i.e., seating, bubblers, display banner poles, lighting)
- Installation of signage distinct to Penrith.

An overview of the current design plan for the proposal is included in Figure 45, with artists impressions of the park provided as Figure 46 and Figure 47.

The impacts of the key elements of the proposed works described above are assessed in Section 8.5. Impacts are separated into potential direct (physical) impacts and potential indirect (visual) impacts to items as a result of the proposal, with assessment terminology used as outlined in Table 3.

8.3 Design development

The current design will be submitted to Council with a Development Application (DA) for the proposed City Park.

8.4 Project justification

The construction of a City Park has been considered an important component in the transformation of Penrith City Centre since 2006. It was identified in the Penrith Progression Action Plan as a key project for promoting growth, development, activation and to create more vibrancy in the city centre.

City Park will be approximately 7,000sqm on the corner of Station Street and Henry Street, Penrith. The location of City Park is a prime central location for an iconic City Park, a short walk from Penrith Train Station and Westfield, and immediately opposite the former Council Chambers. The City Park location is perfectly situated to support and compliment future city centre investment and development.

The park will provide benefits during the day for city centre workers and shoppers and in the evening, activating the city's restaurants and other social opportunities. City Park will attract visitors to the city centre and encourage residents and workers to get outside, exercise and connect with one another.

City Park is identified in Councils Operational Plan as priority project. As such, the concept design has been completed to enable the project to move to the detailed design stage in January 2021. Construction of City Park will begin in late 2021 and will be completed in early 2023.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figure 45. Current design plans for the proposal. (Source: JMD Design)

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Figure 46. Supplied by JMD Design – Artists Impression of City Park in Spring, trees 6 months after installation

Figure 47. Supplied by JMD Design – Artists impression of Penrith City Park in Spring, trees at 15-20 year maturity

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.5 Assessment of heritage impact

The following assessment of heritage impacts has focused on those aspects of the proposed works with the potential to impact on listed and unlisted heritage items within and around the study area.

8.5.1 Impact on listed items

There are three listed heritage items of local significance in the vicinity of the study area. The Penrith Council Chambers (former) (Penrith LEP 2010 Item No.189) is located approximately 15 m north of the study area, the TAFE Building (Penrith LEP 2010 Item No.689) is located approximately 15 m northeast of the study area and the Prospect Electricity Building (former) (Penrith LEP 2010 Item No. 701) is located approximately 16 m west of the study area.

8.5.1.1 Direct (physical) impacts

The proposed works associated with the Penrith City Park project involve large-scale demolition of all properties within the study area to facilitate the construction of a city park. The listed heritage items are positioned outside the study area at a distance of more than 10 m and will not be physically altered as a result of the demolition works.

However, there is some potential for the three heritage listed items to experience vibration levels above the cosmetic damage screening criteria during the bulk demolition and remediation works. Further assessment (including a vibration risk assessment) and vibration monitoring (if required) is recommended.

Assuming vibration impacts would be mitigated during the works period, the proposed works would result in an overall **neutral** direct (physical) impact to the three locally significant listed items.

8.5.1.2 Indirect (visual) impacts

The proposed works associated with the Penrith City Park project involve the demolition of all existing structures within the study area. All listed heritage items have direct views towards the study area's Post-War commercial development, including the John Price & Son funeral home. The heritage items were constructed in the late 1950s-1960s, a decade after the construction of the majority of the buildings within the study area. The demolition of these structures would alter the wider setting of all three heritage items, removing the existing views and altering the visual character of the area.

However, the proposed works do not involve the construction of new vertical elements or large obtrusive structures, and instead involve the development of a city park with green spaces. Any new structures would be low-rise and set back from the street as to maintain the current view lines to and from heritage items. The views from the listed heritage items, therefore, would not be further obscured by modern structures and may be opened up by the presence of an open space. As the development will not significantly obscure the views with permanent vertical structures, the visual impact of the works is minimized.

The proposed works would result in an overall **minor** indirect (visual) impact to the three locally significant heritage items.

8.5.2 Impact on unlisted potential heritage item

There is one unlisted potential heritage item located within the north-western portion of the study area at the corner of Station and Henry Streets (John Price & Son Funeral Home [former]). This item will be demolished as part of the proposal.

8.5.2.1 Direct impacts

The proposed works associated with the Penrith City Park project involve the complete demolition of the former John Price & Son funeral home. This would remove all significant fabric of the funeral

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

home, courtyard and associated outbuildings and would remove all significance associated with the property as assessed in Section 7.1.4.

Overall, the proposed works would result in a **major** direct (physical) impact to the John Price & Son Funeral Home (former) and would result in total loss of significance of the property.

8.5.2.2 Indirect (visual) impacts

The proposed works associated with the Penrith City Park project involve the complete demolition of the former John Price & Son funeral home. This would remove all visual characteristics of the funeral home, courtyard and associated outbuildings as well as views to and from the property. The demolition would remove all aesthetic heritage values associated with the property as assessed in Section 7.1.4.

Overall, the proposed works would result in a **major** indirect (visual) impact to the John Price & Son Funeral Home (former) and would result in total loss of significance of the property.

8.6 Archaeological impact assessment

The demolition methodology will be confirmed by the Demolition and Remediation consultant at a later stage of the project. The methodology for removal of extant structures and the degree of bulk earthworks following removal is therefore unknown at this stage.

An updated archaeological impact assessment should be prepared as part of the archaeological research design (ARD) process once the demolition methodology has been prepared and/or further information on the extent of bulk earthworks and other ground-disturbing activities during the demolition process is known.

8.6.1 Penrith Development Control Plan 2014

The Penrith DCP 2014 contains controls and recommendations for the conservation of heritage items and development within the vicinity of heritage items and conservation areas. The objectives of the controls are to ensure that the development of land or a building in the vicinity of a heritage item or heritage conservation area is undertaken in a manner that complements the heritage significance of the site or area. The controls also aim to introduce detailed urban design controls and guidelines which aim to retain the built forms of the streetscape and help guide new development within the existing streetscape.

The report recommends that any future works comply with the controls set within the DCP. These design controls and their assessment against the proposal are outlined in Table 14.

Table 14: Penrith DCP 2014 controls

Control	Assessment
a) To conserve and maintain established setbacks to streets	The proposal would be set back from the street as to not impose upon view lines to and from heritage items. Any new additions would be low-rise as to maintain the current Post-War setting of the surrounding area. The proposed use of the study area would open view lines between and towards surrounding heritage items.
b) To ensure adequate curtilage and landscape setting for the item	The proposal would not encroach upon the heritage curtilages of heritage listed items within the vicinity of the study area.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Control	Assessment
c) To ensure the integrity of the heritage item and its setting, or the conservation area, is retained	The proposal would take into consideration the Post-War architectural style of the surrounding area and endeavour to maintain current view lines to and from heritage items. The proposed use of the study area would potentially open view lines between and towards surrounding heritage items.
d) by the careful siting of new buildings and alterations and additions to existing buildings	There would be no direct (physical) impact to listed heritage items as a result of the proposal. Any new structures would be low-rise and set back from the street as to maintain the current view lines associated with the listed heritage items.
e) To ensure that the subdivision of land on which a heritage building is located does not isolate the building from its setting or context, or adversely affect its amenity or privacy	The proposal would not encroach upon the heritage curtilage of heritage listed items within the vicinity of the study area.
f) To ensure that the development of land or a building in the vicinity of a heritage item is undertaken in a manner that complements the heritage significance of the site	The proposal would take into consideration the Post-War architectural style of the surrounding area and, where possible, consider brickwork within the proposal (i.e., brick paving) to tie in with the Post-War aesthetic character of the surrounding area and heritage item.
g) To ensure that new development is carefully sited so as to avoid causing physical damage to any heritage item especially where sited within the same curtilage as the heritage item	The proposal would not encroach upon the heritage curtilage of heritage listed items within the vicinity of the study area.
h) To ensure that new development, including alterations, additions, extensions, additional buildings or structures, are designed to minimise any potential impacts to adjoining heritage items	The proposed use of the study area is in keeping with the surrounding area and final design would aim to minimise impacts to adjoining heritage items.
i) To protect the heritage significance of heritage items and items within heritage conservation areas	The proposal would not encroach upon the heritage curtilage of listed heritage items within the vicinity of the study area. The proposal is not expected to cause a heritage impact level above minor to heritage items within the vicinity of the study area.
j) To conserve and protect significant items of European heritage that are located in the industrial areas of the City	The proposal would not encroach upon the curtilage of listed heritage items and is not expected to cause a heritage impact level above minor to heritage items within the vicinity of the study area.
k) To prevent the demolition of heritage items or items within heritage conservations areas	The proposal would not result in the demolition of heritage listed structures, though one unlisted item of local heritage significance will be demolished. The unlisted heritage item will be majorly impacted, resulting in total loss. The proposal is not expected to cause a heritage impact level above minor to listed heritage items within the vicinity of the study area.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Control	Assessment
l) To ensure that new development located within the curtilage of a heritage item is in keeping with the context and setting of the heritage item	The proposal would take into consideration the Post-War architectural style of the surrounding area. New structures should be low-scale and set back from the street as to not impose upon view lines to and from heritage items. In addition, brickwork should be considered in the proposal (i.e., brick paving) to tie in with the Post-War aesthetic character of the surrounding area and heritage items.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

8.7 Statement of heritage impact

A statement of heritage impact has been prepared in accordance with the model provided in the NSW Heritage Division (now Heritage NSW) guidelines which delineates a statement of heritage impact into five key component questions Table 15.[53]

Table 15. Statement of Heritage Impact for the proposed works for the Penrith City Park project

Impact	Discussion
What aspects of the proposal respect or enhance the heritage significance of the study area?	The proposal would not involve the alteration of any listed heritage items surrounding the study area or impinge on their curtilages. The design of the Penrith City Park would take into consideration the Post-War character of the study area, maintaining aesthetic consistency for the three locally significant heritage items where feasible. New structures would not impose upon view lines to and from the heritage items, with the majority of the proposal involving the creation of green space and any structures planned to be low-rise and set back from the street. Additionally, material such as the Chromatex bricks will be considered in the landscaping as visual references to the Post-War aesthetic character of the surrounding area. The retention of the octagonal ornamental fountain, *in situ* if feasible, ensures that a significant aspect of the unlisted heritage item, the John Price & Son Funeral Home, will be protected and incorporated into the development.
What aspects of the proposal could have a detrimental impact on the heritage significance of the study area?	The proposal would result in neutral direct (physical) impacts to the three locally significant heritage items, as the heritage items are located outside of the study area. However, the proposal will demolish all structures within the study area, resulting in the total loss of an unlisted heritage item, the former John Price & Son Funeral Home. This can be partially mitigated by the salvage of significant material, including the Chromatex bricks and stained glass windows, for future use. The octagonal ornamental fountain would also be protected and retained *in situ.* The visual characteristics and settings of the listed heritage items will also be altered by the large-scale demolition; however, as no medium- or high-rise vertical structures are being considered views are not likely to be significantly obscured.

[53] NSW Heritage Division, *Statements of Heritage Impact.* Accessed online https://www.environment.nsw.gov.au/resources/heritagebranch/heritage/hmstatementsofhi.pdf

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

Have more sympathetic options been considered and discounted?	The proposal has been designed to avoid the curtilages of listed heritage items surrounding the study area and will demolish a single unlisted potential heritage item. This has been assessed as the most sympathetic option for the proposed works. An alternative design option, comprising of the complete demolition of the John Price & Son Funeral Home and ornamental fountain was considered. This option would have discarded all significant fabric, including the Chromatex bricks and stained glass windows. This alternative design option was discounted as it would have resulted in the total loss of all significant fabric associated with the unlisted heritage item. An alternative design option, comprising a large built entrance structure to the park at the intersection of Henry Street and Station Street was considered. However, that option was discounted once the decision was made to keep the ornamental fount, with the built structure replaced with a large Fig tree in order to better reflect the 'domestic scale' of the preserved ornamental fountain.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

9.0 CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

This HIS has made the following conclusions:

- There are three listed heritage items in the vicinity of the proposed works:
  - Penrith Council Chambers (former) (Penrith LEP 2010 Item No. 189)
  - TAFE Building (Penrith LEP 2010 Item No. 689)
  - Prospect Electricity Building (former) (Penrith LEP 2010 Item No. 701)
- There is one unlisted potential heritage item in the vicinity of the proposed works:
  - John Price & Son Funeral Home (former), assessed as of local significance
- The study area has been assessed as having nil potential to contain locally significant archaeological remains dating to the first European occupation phase of the site (1789 – c1850s), low potential to contain archaeological remains of local significance relating to the mid-late nineteenth century commercial development and occupation of the site (Phase 2: c1850s - c1900) and moderate potential to contain archaeological remains of local significance relating to the early twentieth century commercial development and occupation of the site (Phase 3: c1900-1950). There is potential that these remains would be considered 'relics' under the *NSW Heritage Act 1977.*
- The proposal has been assessed as having a:
  - Neutral direct (physical) impact to the Penrith Council Chambers (former) heritage item
  - Minor indirect (visual) impact to the Penrith Council Chambers (former) heritage item
  - Neutral direct (physical) impact to the TAFE Building heritage item
  - Minor indirect (visual) impact to the TAFE Building heritage item
  - Neutral direct (physical) impact to the Prospect Electricity Building (former) heritage item
  - Minor indirect (visual) impact to the Prospect Electricity Building (former) heritage item
  - Major direct (physical) impact (demolition) to the John Price & Son Funeral Home unlisted heritage item
  - Major indirect (visual) impact (demolition) to the John Price & Son Funeral Home unlisted potential heritage item
  - Potential impact to areas assessed as demonstrating potential for archaeological remains.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

9.2 Recommendations

The following recommendations would be considered during further development of the proposal design.

General

- Comprehensive photographic archival recording of the interiors and exteriors of the John Price & Son funeral home in accordance with relevant Heritage Division's guidelines should be conducted prior to demolition of the building. The photographic archival recording of each item would be carried out prior to works commencing, and in some cases, during the construction program. It should be prepared in accordance with the NSW Heritage Office's *How to Prepare Archival Records of Heritage Items* (1998), and *Photographic Recording of Heritage Items Using Film or Digital Capture* (2006) by a suitably qualified heritage consultant using archival-quality material.
- A 3D scan or photogrammetry of the John Price & Son funeral home should be considered in addition to the photographic archival recording.
- The ornamental octagonal fountain from the John Price & Son funeral home will be retained *in situ* and protected during works, and form part of the park landscaping following the completion of works.
- The stained glass windows and Chromatex bricks from the John Price & Son funeral home should be salvaged during demolition works.
- Where feasible, the Chromatex bricks from the John Price & Son funeral home should be reused in the park landscaping following the completion of works. If any damage is sustained by the octagonal fountain during works, these bricks may be suitable as replacements.
- A salvage methodology would be prepared for the octagonal fountain, Chromatex bricks and stained glass windows of the John Price & Son funeral home, detailing the specific recommendations for the safety of the items during the demolition process and possible next steps e.g., donation to local historical societies. Structural engineers would be consulted as part of this preparation.
- Opportunities for providing historical interpretive displays in the proposal design would be explored.
- All relevant staff, contractors and subcontractors should be made aware of their statutory obligations for heritage under *NSW National Parks and Wildlife Act 1974* and *NSW Heritage Act 1977*. This may be implemented as a heritage induction.

Archaeology

- As the potential for historical relics has been identified within the study area and the detailed design is currently unknown, archaeological testing under a Section 139 (s139) (1B) Exception permit is recommended. This would inform future designs for the proposal and involve:
  - A s139 (1B) exception permit application would be prepared and submitted to Heritage NSW, DPC for approval prior to works commencing

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

  - The s139 (1B) application will require the preparation of an archaeological research design (ARD), with an archaeological excavation methodology, which would be submitted in support of the permit application. The ARD should include additional primary research where required to inform the excavation methodology, and an impact assessment once the demolition methodology has been prepared by the demolition contractor
  - A program of archaeological test excavation and monitoring would be undertaken in accordance with the s139 conditions and ARD in areas assessed as containing potential for locally significant archaeological remains
  - Results derived from archaeological test excavations would be used to inform future detailed designs for the project including areas that should be avoided by subsurface impacts where feasible.
- If archaeological remains are found during testing and impacts cannot be avoided, a Section 140 Excavation permit would be required from Heritage NSW:
  - A s140 excavation permit application would be prepared and submitted to Heritage NSW, DPC for approval prior to works commencing
  - This would require the preparation of an archaeological research design (ARD), with a historical archaeological excavation methodology, which would be submitted in support of the permit application
  - A program of archaeological salvage excavation would be undertaken in accordance with the s140 conditions and ARD.
- An Unexpected Finds Procedure would be prepared as part of the archaeological investigations. The NSW Heritage Division would be notified of the discovery of a relic in accordance with Section 146 of the NSW Heritage Act 1977.

Vibration impacts

- During construction and demolition works, monitoring of vibration impacts to the locally significant former Council Chambers (Penrith LEP 2010 Item No. 189), TAFE Building (Penrith LEP 2010 Item No. 689) and former Prospect Electricity Building (Penrith LEP 2010 Item No. 701) would be undertaken by structural engineers or a vibration specialist. Assessment and monitoring of vibration impacts would adhere to the:
  - British Standard BS 7385: *Part 2: Evaluation and Measurement for Vibrations in Buildings – Part 2 Guide to Damage Levels from Ground-Borne Vibration*
  - German Standard DIN 4150 *Part 3: Structural Vibration in Buildings: Effects on Structures.*
- If vibration monitors are necessary for listed heritage items, non-invasive adhesive methods such as beeswax would be considered.
- If it is identified that levels of vibration would result in damage to heritage fabric associated with the listed heritage items, works must cease and the construction methodology be

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

reviewed by project engineers in consultation with a heritage consultant to mitigate further impacts.

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

LANDMARK
PLANNING

13 April 2021

General Manager
Penrith City Council
P O Box 60
PENRITH NSW 2751

Attn: Peter Wood –Development Services Manager

Dear Peter,

Re: Peer Review – Development Application No. 21/0045 – Proposed Demolition Works & Land Remediation Works – Henry & Station Streets, St Marys

I refer to the above development application which was lodged by Penrith City Council for Demolition Works & Land Remediation Works at 134-144 Henry Street and 42-50 Station Street, Penrith. The works will allow for the future development of the land as a public park, which is subject to a seperate application DA 20/0047.

I have reviewed the development application documentation and the draft Council Report prepared by your Senior Development Assessment Planner Lucy Goldstein. I concur with the findings and recommendations of the draft Council Report.

The provisions of State Environmental Planning Policy No.55 – Remediation of Land have been suitably addressed by way of various investigations including soil, groundwater and vapour analysis; and staged remediation of the site being proposed in accordance with the staged Remedial Work Plans, guided by the overarching Remedial Action Plan which will make the site suitable for the future planned recreational use of the site.

I note that the site is zoned RE1 Public Recreation and B4 Mixed Use under Penrith Local Environmental Plan 2010. The proposal is compatible with the RE1 zone objectives, in particular "*to enable land to be used for public open space or recreational purposes"* and B4 zone objectives, in particular "*to provide a mixture of compatible land uses"* and *"to create opportunities to improve public amenity".*

The proposal is considered demolition and remediation works are permitted under Local Environmental Plan 2010.

Heritage items are located within the vicinity of the site and a potential unlisted item on the subject site. It is noted that the application has been accompanied by a Heritage Impact Statement and on balance, the demolition of the potential item being John Price & Son Funeral Home, has been considered appropriate for the improved public benefit, subject to photographic archiving, retention

Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021

of the ornamental fountain in place, salvage of stained glass windows and bricks and other necessary conditions to protect the adjoining heritage items.

The provisions of DCP 2014 identify the site as a City Park and City Square.

The report notes the presence of a large, well established Lemon Scented Gum and that this tree will be retained and incorporated into the future design of the park, with appropriate conditions recommended to ensure this occurs.

Community consultation occurred and no submissions were received.

I consider that the proposal is well founded and provides a site suitable for future redevelopment as a recreation area, which will provide for improved facilities for the public. The proposal will assist in the revisualisation and improvement of the public areas of Penrith, consistent with the planned location of a new city park.

It is concluded that the proposed works are permissible within the zone and that the assessment has suitably considered the key considerations of Section 4.15 of the Environmental Planning & Assessment Act, 1979. The recommendation and proposed conditions are considered to be appropriate.

Yours faithfully,

LANDMARK
PLANNING

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Document Set ID: 9547379
Version: 1, Version Date: 14/04/2021