ENVIRONMENTAL INVESTIGATION SERVICES

20 November 2018
Ref: E31675KRadd rev1

Cadence Property Group

Attention: Mr Mitchell Kent
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ADDENDUM – ADDITIONAL DATA GAP INVESTIGATION
PROPOSED WAREHOUSE DEVELOPMENT
128 ANDREWS ROAD, PENRITH

1 INTRODUCTION

This letter forms an addendum to the EIS report titled "*Report To Cadence Property Group Pty Ltd On Stage 1/Stage 2 Environmental Site Assessment and Preliminary Salinity Assessment For Proposed Warehouse Development at 128 Andrews Road, Penrith, NSW. Ref E31675Krpt Rev1, 30 October 2018*[1]"

This letter summarises the additional site works undertaken to close out the data gaps identified in EIS 2018. The scope of works included:

- Installation of four groundwater monitoring wells;
- Sampling and analysis of the groundwater;
- Additional sampling of the stockpiles identified on-site; and
- Confirmation of the presence of asbestos in a fragment of fibre-cement pipe observed on the site surface.

2 PROPOSED DEVELOPMENT DETAILS /BACKGROUND

The proposed development includes a 50,000m^2 warehouse to be constructed within the 85,000m^2 site. The warehouse will be accessed by pavements adjacent to the warehouse, and by a driveway constructed off Andrews Road to the east and north-east of the site. It is understood that the development will be constructed at about the existing surface level, with some cut and fill earthworks of approximately 1.5m.

EIS 2018 identified elevated concentrations of contaminants above the ecological site assessment criteria (SAC). The contaminants included heavy metals and TRH F3 fraction in soil in the south-western section and western end of the site. The groundwater could not be assessed as the wells installed to a

[1] Referred to as EIS 2018

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depth of approximately 4.0m below ground level (BGL) remained dry after installation. Elevated concentrations of copper and zinc were encountered above the ecological SAC in the surface water. The preliminary assessment of the soil stockpiles did not identify elevated concentrations of contaminants above the SAC, however the stockpiles required further assessment to meet the minimum sampling density for stockpiles recommended in NEPM 2013. On this basis, EIS were of the opinion that potential risks to ecology, associated with contamination (i.e. the CoPC) within the site were present and were considered to be minor.

The report identified the following data gaps

- The groundwater could not be assessed;
- The presence of asbestos in a fragment of fibre cement pipe identified on site was not confirmed; and
- There were limited samples collected from the stockpiles for a preliminary contamination screening.

Remediation was not considered to be required. Potential risks associated with sources of contamination could be addressed via the proposed earthworks and implementation of recommendations outlined in Section 11 of report EIS 2018.

3 SITE INSPECTION AND FIELDWORK

Additional fieldwork took place on the 5, 6 and 12 November 2018. The site remained unchanged from the EIS 2018 investigation.

3.1 Soil Sampling Plan and Methodology

The additional soil sampling plan and methodology adopted for the assessment is outlined in the table below:

Aspect	Input
Sampling Density	The volumes of the stockpiles at the western section of the site were estimated to be as follows: - SP1 approximately 80m^3; - SP2 approximately 800m^3; - SP3 approximately 1,625m^3; - SP4 approximately 375m^3; and - SP5 approximately 540m^3. The initial screening of the stockpiles involved analysing two samples from each of the stockpiles. The site observations and the chemical data indicated that all five stockpiles contained similar materials. On this basis, the stockpiles were treated as one large stockpile for the calculation of an appropriate sampling density. A total of 18 stockpile samples were analysed (ten samples for EIS 2018 and eight samples for this investigation). This number of

Aspect	Input
	samples meets the minimum density required to demonstrate that the average contaminant concentration in a 3,500m^3 stockpile is at or below the site assessment criteria (SAC) with 95% confidence.
Sampling Plan	The additional sampling was distributed as follows shown on Figure 3 attached in the appendices: • One additional sample from Stockpiles 1, 2, 4 and 5; and • Four additional samples from Stockpile 4.
Set-out and Sampling Equipment	Samples from the stockpiles were collected using a hand auger.
Sample Collection and Field QA/QC	Soil samples were obtained on 6 November 2018. The stockpile samples were collected from at least 0.1m-0.2m depth into the stockpile. Samples were placed in glass jars with plastic caps and teflon seals with minimal headspace. Samples for asbestos analysis were placed in zip-lock plastic bags. During sampling, soil at selected depths was split into primary and duplicate samples for field QA/QC analysis.
Field Screening	A portable Photoionisation Detector (PID) fitted with a 10.6mV lamp was used to screen the samples for the presence of volatile organic compounds (VOCs). PID screening for VOCs was undertaken on soil samples using the soil sample headspace method. VOC data was obtained from partly filled zip-lock plastic bags following equilibration of the headspace gases. PID calibration records are maintained on file by EIS. The sampling locations were visually inspected during the works for the presence of fibre cement fragments.
Decontami-nation and Sample Preservation	Sampling personnel used disposable nitrile gloves during sampling activities. Re-usable sampling equipment was decontaminated as outlined in the Standard Sampling Procedure (SSP) described in EIS 2018. Soil samples were preserved by immediate storage in an insulated sample container with ice in accordance with the SSP. On completion of the fieldwork, the samples were stored temporarily in fridges in the EIS warehouse before being delivered in the insulated sample container to a NATA registered laboratory for analysis under standard chain of custody (COC) procedures.

3.2 Groundwater Sampling Plan and Methodology

The groundwater sampling plan and methodology is outlined in the table below:

Aspect	Input
Sampling Plan	Groundwater monitoring wells were installed in MW201, MW202, MW203 and MW204. The wells were positioned to gain a snap-shot of the groundwater conditions as shown on the attached Figure 2. Considering the topography and the location of the nearest down-gradient water body, MW203 and MW204 were considered to be in the up-gradient area of the site and would be expected to provide an indication of groundwater flowing onto (beneath) the site from the north and north-east. During field work it was noted that one of the above ground tanks (ASTs) on the site to the north had the faint remains of a Caltex logo on the side. MW204 was located immediately to the south of these ASTs. MW202 was located in the central /west section of the site to provide an indication of groundwater in the central west section of the site. MW201 was located close to the south boundary and an AST that was observed on the site to the south.
Monitoring Well Installation Procedure	The monitoring well construction details are documented on the appropriate borehole logs attached in the appendices. The monitoring wells were installed to depths of approximately 8.0 m to 9.0mBGL. The wells were generally constructed as follows: • 50mm diameter Class 18 PVC (machine slotted screen) was installed in the lower section of the well to intersect groundwater; • 50mm diameter Class 18 PVC casing was installed in the upper section of the well (screw fixed); • A 2mm sand filter pack was used around the screen section for groundwater infiltration; • A hydrated bentonite seal/plug was used on top of the sand pack to seal the well; and • A gatic cover was installed at the surface with a concrete plug to limit the inflow of surface water.
Monitoring Well Development	The monitoring wells were purged on the 5 and 6 November. No field parameters were measured as the water that was purged was very silty as a result of the drilling process. No odours or sheen were associated with the purged water.
Groundwater Sampling	The monitoring wells were allowed to recharge for approximately five to seven days after installation. Samples were obtained using either a peristaltic pump or disposable bailer. The pump could not be used in all the boreholes as the depth to the groundwater was close to the operational limit of the pump. The field monitoring record data are attached in the appendices.

3.3 Fibre Cement Fragment (FCF)

A large fragment of fibre cement pipe (152mm by 140mm) was recovered from the surface of the site and bagged for analysis. A surface inspection of an approximately 5m radius around the fragment's location (location F2 on Figure 2) was undertaken and no further fragments were observed. No fragments were observed in the fill during the EIS 2018 investigation.

3.4 Analytical Schedule

The analytical schedule is outlined in the following table:

Analyte/CoPC	Stockpile Samples	Fibre Cement Material Samples	Groundwater Samples
Heavy Metals (8)	8	-	4
TRH/BTEX	8	-	4
PAHs	8	-	4
VOCs	-	-	4
Asbestos	8	1	-
Ammonia	-		4
pH/EC	-	-	4

3.4.1 Laboratory Analysis

Samples were analysed by an appropriate, NATA Accredited laboratory using the analytical methods detailed in Schedule B(3) of NEPM 2013. Reference should be made to the laboratory reports attached in the appendices for further details.

Table 3-1: Laboratory Details

Samples	Laboratory	Report Reference
All primary samples and field QA/QC samples including (intra-laboratory duplicates, trip blanks, trip spike)	Envirolab Services Pty Ltd NSW, NATA Accreditation Number – 2901 (ISO/IEC 17025 compliance)	205182 and 205400

4 SITE ASSESSMENT CRITERIA (SAC)

The SAC were derived from the NEPM 2013 and other guidelines as discussed in the following sub-sections. The guideline values for individual contaminants are presented in the attached report tables and further explanation of the various criteria adopted is provided in the appendices EIS 2018.

4.1 Soil

Soil data were compared to relevant Tier 1 screening criteria in accordance with NEPM (2013) as outlined below.

4.1.1 Human Health

- Health Investigation Levels (HILs) for a 'commercial/industrial' exposure scenario (HIL-D);
- Health Screening Levels (HSLs) for a 'commercial/industrial' exposure scenario (HSL-D). HSLs were calculated based on the soil type and the depth of the sample from the existing ground surface as the proposed building floor level is expected to be constructed approximately at the existing grade;
- Where exceedances of the HSLs were reported for hydrocarbons (TRH/BTEX and naphthalene), the soil health screening levels for direct contact presented in the CRC Care Technical Report No. 10 – Heath screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document (2011)[2]were considered; and
- Asbestos was assessed on the basis of presence/absence. Asbestos HSLs were not adopted as detailed asbestos quantification was not undertaken:

4.1.2 Environment (Ecological – terrestrial ecosystems)

- Ecological Investigation Levels (EILs) and Ecological Screening Levels (ESLs) for a 'commercial/industrial' exposure scenario. These have only been applied to the top 4.1m of soil. The criteria for benzo(a)pyrene has been increased from the value presented in NEPM (2013) based on the information presented in the CRC Care Technical Report No. 39 – Risk-based management and guidance for benzo(a)pyrene (2017)[3];
- ESLs were calculated based on the soil type. EILs for selected metals were calculated using average site specific soil parameters for pH (6.3), cation exchange capacity (8 cmolc/kg) and clay content (18.3 % clay). These data were used to select the added contaminant limit (ACL) values presented in Schedule B(1) of NEPM (2013), and published ambient background concentration (ABC) presented in the document titled Trace Element Concentrations in Soils from Rural and

[2] Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC Care), (2011). Technical Report No. 10 - *Health screening levels for hydrocarbons in soil and groundwater Part 1: Technical development document*

[3] CRC Care, (2011). *Technical Report No. 39 - Risk-based management and guidance for benzo(a)pyrene*

Urban Areas of Australia (1995)[4].This method is considered to be adequate for the Tier 1 screening.

4.2 Groundwater

Groundwater data were compared to relevant Tier 1 screening criteria in accordance with NEPM (2013), following an assessment of environmental values in accordance with the Guidelines for the Assessment and Management of Groundwater Contamination (2007)[5]. Environmental values for this assessment include aquatic ecosystems, human uses, and human-health risks in non-use scenarios.

4.2.1 Human Health

HSLs for a 'commercial/industrial' exposure scenario (HSL-D). HSLs were calculated based on the soil type and the observed depth to groundwater.

4.2.2 Environment (Ecological - aquatic ecosystems)

Groundwater Investigation Levels (GILs) for 95% trigger values for protection of freshwater species presented in Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)[6]. The 99% trigger values were adopted where required to account for bioaccumulation. Low and moderate reliability trigger values were also adopted for some contaminants where high-reliability trigger values don't exist.

5 DATA (QA/QC) EVALUATION

The data evaluation is presented in the appendices. In summary, EIS are of the opinion that the data are adequately precise, accurate, representative, comparable and complete to serve as a basis for interpretation to achieve the investigation objectives.

5.1 Field and Laboratory Considerations

The quality of the analytical data produced for this project has been considered in relation to the following:

- Sample collection, storage, transport and analysis;
- Laboratory PQLs;
- Field QA/QC results; and
- Laboratory QA/QC results.

[4]Olszowy, H., Torr, P., and Imray, P., (1995), *Trace Element Concentrations in Soils from Rural and Urban Areas of Australia. Contaminated Sites Monograph Series No. 4*. Department of Human Services and Health, Environment Protection Agency, and South Australian Health Commission.

[5] NSW Department of Environment and Conservation, (2007). *Guidelines for the Assessment and Management of Groundwater Contamination*

[6] ANZECC, (2000). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* (referred to as ANZECC 2000)

5.2 Field QA/QC Samples and Analysis

A summary of the field QA/QC samples collected and analysed for this assessment is provided in the following table:

Sample Type	Sample Identification	Frequency (of Sample Type)	Analysis Performed
Intra-laboratory duplicate (soil)	PB-1 (primary sample BH1 0-0.1m)	Approximately 10% of primary samples	Heavy metals, TRH/BTEX, PAHs, OCPs, OPPs and PCBs
Intra-laboratory duplicate (water)	DUP MP-1 (primary sample MW204)	Approximately 25% of primary samples	Heavy metals, TRH/BTEX, PAHs, VOCs
Trip spike (water)	TS1 (12/11/2018)	One for the assessment to demonstrate adequacy of preservation, storage and transport methods	BTEX
Trip blank (water)	TB (12/11/2018)	One for the assessment to demonstrate adequacy of storage and transport methods	BTEX

The results for the field QA/QC samples are detailed in the laboratory summary tables (Table G to Table I inclusive) attached to this addendum latter and are discussed below.

The QA/QC data was assessed in accordance with the criteria specified in EIS 2018.

5.3 Data Evaluation

5.3.1 Sample Collection, Storage and Analysis

Samples were collected by trained field staff in accordance with the EIS SSP. The SSP was developed to be consistent with relevant guidelines, including NEPM (2013) and other guidelines made under the CLM Act 1997.

Appropriate sample preservation, handling and storage procedures were adopted. Laboratory analysis was undertaken within specified holding times in accordance with Schedule B(3) of NEPM (2013) and the laboratory NATA accredited methodologies.

Review of the project data also indicated that:

- COC documentation was adequately maintained;

- Sample receipt advice documentation was provided for all sample batches;
- All analytical results were reported; and
- Consistent units were used to report the analysis results.

5.4 Laboratory PQLs

Appropriate PQLs were adopted for the analysis and all PQLs were below the SAC with the exception of the anthracene PQL for groundwater analysis which was 10 times greater than the ecological SAC. In light of the PAH concentrations reported for soil and groundwater, EIS are of the opinion that this is not significant, and it does not affect the quality of the dataset as a whole or the outcome of the assessment.

5.5 Field QA/QC Sample Results

Field Duplicates

The results indicated that field precision was acceptable. RPD non-conformances were reported for some analytes as discussed below:

- Elevated RPDs were reported for chromium and copper in PB-1/SP1-3. Values outside the acceptable limits have been attributed to minor sample heterogeneity and the difficulties associated with obtaining homogenous duplicate samples of heterogeneous matrices. As both the primary and duplicate sample results were less than the SAC, the exceedances are not considered to have had an adverse impact on the data set as a whole.

Field Blanks

During the investigation, one water trip blank was placed in the esky during sampling and transported back to the laboratory with the groundwater samples. The results were all less than the PQLs, therefore cross contamination between samples that may have significance for data validity did not occur.

Trip Spikes

The results ranged from 104% to 109% and indicated that field preservation methods were appropriate.

5.6 Laboratory QA/QC

The analytical methods implemented by the laboratory were performed in accordance with their NATA accreditation and were consistent with Schedule B(3) of NEPM (2013). The frequency of data reported for the laboratory QA/QC (i.e. duplicates, spikes, blanks, LCS) was considered to be acceptable for the purpose of this assessment.

A review of the laboratory QA/QC data identified the following minor non-conformances:

- Excessive sample volumes were provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL)

of sample in its own container as per AS4964-2004.Note: Samples 205182-6,11 were sub-sampled from bags provided by the client.

- Acid Extractable Metals in Soil - Spike recovery for Cr and Cu in sample #5 at 164% and 173% respectively which is outside lab acceptance criteria (70-130%), however, the LCS recovery is acceptable at 103% for both elements, sample heterogeneity suspected.
- Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 205182-1 for Cr. Therefore a triplicate result has been issued as laboratory sample number 205182-20.

5.7 Data Quality Summary

EIS are of the opinion that the data are adequately precise, accurate, representative, comparable and complete to serve as a basis for interpretation to achieve the investigation objectives.

Non-conformances were reported for some field QA/QC samples and laboratory QA/QC analysis. These non-conformances were considered to be sporadic and minor, and were not considered to be indicative of systematic sampling or analytical errors. On this basis, these non-conformances are not considered to materially impact the report findings.

6 RESULTS

6.1 Subsurface Conditions

A summary of the subsurface conditions encountered during the investigation is presented in the table below. Reference should be made to the borehole logs attached in the appendices for further details.

Table 6-1: Summary of Subsurface Conditions

Profile	Description
Fill	Fill was encountered at the surface in all four boreholes and ranged in depth from approximately 0.3 to 0.4mBGL. The fill typically comprised low plasticity silt with traces of root fibres. No staining or odours were noted in the fill material.
Natural Soil	Natural material was encountered below the fill in all boreholes, except in BH189 which was terminated in the fill. The natural material typically comprised orange brown, low plasticity silt underlain by silty sandy gravel. The depth to the gravel layer was approximately 3.9mBGL No staining or odours were noted in the natural material.
Bedrock	Bedrock was not encountered in any of the boreholes.

Profile	Description
Groundwater	Groundwater seepage was observed at depths ranging from 5.92m to 6.5mBGL. The standing groundwater level (SWL) measured approximately 6 days after the monitoring well installation ranged from 6.19mBGL to 6.62mBGL.

6.2 Stockpiles

The stockpiled fill soil was a mixture of silty sandy clay, silty clay and clayey silt. Traces of igneous gravel brick, ash and concrete were also observed. An inspection of the stockpiles was restricted by dense vegetation.

6.3 Field Screening

A summary of the field screening results are presented in the table below.

Table 6-2: Summary of Field Screening

Aspect	Details
PID Screening of Soil Samples for VOCs	PID soil sample headspace readings are presented in attached report tables and the COC documents attached in the appendices. The results from all of the stockpile samples obtained from both investigations were less than 1ppm equivalent isobutylene. These results indicate a lack of PID detectable VOCs in the stockpile samples. The PID readings in the groundwater wells were less than 5ppm equivalent isobutylene. and indicate a lack of PID detectable VOCs in the groundwater wells.
Groundwater Depth & Flow	The standing ground water levels ranged from 6.19mBGL to 6.62mBGL. Groundwater studies on the adjacent property to the south indicate that the regional groundwater flow is to the south.

6.4 Soil Laboratory Results

6.4.1 Human Health and Environmental (Ecological) Assessment

The soil laboratory results for all of the stockpile samples from both investigations are compared to the relevant SAC in the attached report tables. A summary of the results assessed against the SAC is presented below:

Analyte	Results Compared to SAC
Heavy Metals	All heavy metals results were below the SAC.

Analyte	Results Compared to SAC
	The 95% UCLs on the mean of the heavy metal concentrations were all less than the SAC. The 95% UCLs were not calculated for arsenic, cadmium or mercury as the majority of results were less than the laboratory PQLs.
TRH	All TRH results were below the SAC. Heavy fraction TRH was detected in one sample, the remaining results were all less than the laboratory PQLs. The 95% UCLs were not calculated for TRH as the majority of results were less than the laboratory PQLs.
BTEX	All BTEX results were below the SAC. All BTEX concentrations were below the laboratory PQLs. The 95% UCLs were not calculated for BTEX as all of the results were less than the laboratory PQLs.
PAHs	All PAH results were below the SAC. Traces of PAHs were detected in three samples, the remaining results were all less than the laboratory PQLs. The 95% UCLs were not calculated for PAHs as the majority of results were less than the laboratory PQLs.
OCPs and OPPs	All OCP and OPP results were below the SAC. All pesticide concentrations were below the laboratory PQLs. The 95% UCLs were not calculated for OCC/OPP as all of the results were less than the laboratory PQLs.
PCBs	All PCB results were below the SAC. All PCB concentrations were below the laboratory PQLs. The 95% UCLs were not calculated for PCBs as all of the results were less than the laboratory PQLs.
Asbestos	All asbestos results were below the SAC (i.e. asbestos was absent in the samples analysed for the investigation).

6.4.2 Waste Classification Assessment

The laboratory results stockpile results from both investigations were assessed against the criteria presented in Part 1 of the Waste Classification Guidelines, as summarised previously in this report. The results are presented in the report tables attached in the appendices. A summary of the results is presented below.

Analyte	No. of Samples Analysed	No. of Results > CT Criteria	No. of Results > SCC Criteria	Comments
Heavy Metals	19	3	0	Nickel concentrations exceeded the CT1 criterion in three fill samples collected from SP1-3, SP2-5 and SP3-8, The maximum nickel concentration was 49mg/kg. The statistical analysis indicated that the 95% UCL limit on the mean value of the nickel concentrations in the stockpiles was 27.5mg/kg and was below the CT-1 value.
TRH	19	0	0	-
BTEX	19	0	0	-
Total PAHs	19	0	0	-
Benzo(a)pyrene	19	0	0	-
OCPs & OPPs	19	0	0	-
PCBs	19	0	0	-
Asbestos in soil	19	0	0	Asbestos was not detected in the soil samples analysed.

6.5 Fibre Cement Fragment

The fibre cement fragment (sample F2) recovered from the site surface contained chrysotile asbestos.

6.6 Groundwater Laboratory Results

The surface water laboratory results are compared to the relevant SAC in the attached report tables. A summary of the results assessed against the SAC is presented below:

Analyte	Results Compared to SAC
Heavy Metals	All heavy metals results were below the SAC.
TRH	All TRH results were below the SAC. All TRH concentrations were below the laboratory PQLs.

Analyte	Results Compared to SAC
BTEX	All BTEX results were below the SAC. All BTEX concentrations were below the laboratory PQLs
Other VOCs	All other VOC results were below the SAC. All VOC concentrations were below the laboratory PQLs
PAHs	All PAH results were below the SAC. All PAH concentrations were below the laboratory PQLs
Ammonia	All ammonia results were below the SAC.
Other Parameters	The results for pH and EC are summarised below: • pH was 6.4 to 7.0 indicating slightly acidic to neutral conditions; • EC was 340µS/cm to 530 µS/cm indicating conditions similar to a freshwater river.

7 SUMMARY OF RESULTS

7.1 Stockpile Assessment

From a contamination risk aspect, the stockpiles are suitable to remain on-site. All of the results were less than the health based and ecological SAC. In the event that the stockpiles have to be disposed of off-site they are classified as **General Solid Waste (non-putrescible)** calculated based on UCLs and should be disposed of to a facility licensed by the EPA to receive this waste stream.

7.2 Fibre Cement Fragment

The presence of asbestos in the fragment of FCF has been confirmed. The fragment was removed form site and will be disposed of by the laboratory. No further surface fragments were identified within a 5m radius of it's location.

7.3 Groundwater

No contaminants were identified in the groundwater samples.

8 CONCLUSION

EIS are of the opinion that the data gaps identified in EIS 2018 have all been addressed and the site is suitable for the proposed development subject to following recommendations made in EIS 2018:

1. The fill in the western section of the site (and the surface soil to a minimum depth of 0.2m in areas where natural soil is present at the surface – see attached borehole logs), including the proposed basin footprint and the area to the south of the basin in the south-western corner of the site, is to be excavated and placed beneath the proposed hardstand provided that it is

geotechnically suitable. If this cannot be achieved, the waste classification is to be confirmed and this material is to be disposed off-site to an appropriate facility; and

2. A surface clearance for asbestos should be undertaken of the disturbed/stockpiled areas in the west section of the site after the vegetation has been cleared. The contingency plan specified below should be implemented in the event that any additional asbestos containing material (ACM) is encountered across the site.

EIS are of the opinion that there is no requirement to notify the EPA under the NSW EPA Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997 (2015)[7].

8.1 Contingency plan

There is a relatively low potential for contamination-related unexpected finds to occur at the site during the proposed development works. Unexpected finds would typically be able to be identified by visual or olfactory indicators and could include:

- Waste materials in fill, including building and demolition waste;
- Fibre cement fragments (e.g. ACM);
- Stained fill/soil;
- Odorous soils (e.g. hydrocarbon odours); and/or
- Ash, slag and/or coal wash.

The following should be implemented in the event of an unexpected find:

- All work in the immediate vicinity should cease and temporary barricades should be erected to isolate the area;
- A suitably qualified contaminated land consultant[8] should be engaged to inspect the find and provide advice on the appropriate course of action; and
- Any actions should be implemented and validated to demonstrate that there are no unacceptable risks to the receptors.

[7] NSW EPA, (2015). *Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997* (referred to as Duty to Report Contamination)

[8] EIS recommend that the consultancy engaged for the work be a member of the Australian Contaminated Land Consultants Associated (ACLCA), and/or the individual undertaking the works be certified under one of the NSW EPA endorsed certified practitioner schemes

9 LIMITATIONS

The findings presented in this letter are based on site conditions that existed at the time of the assessment. The conclusions are based on the investigation of conditions at specific locations, chosen to be as representative as possible under the given circumstances.

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If you have any questions concerning the contents of this letter please do not hesitate to contact us.

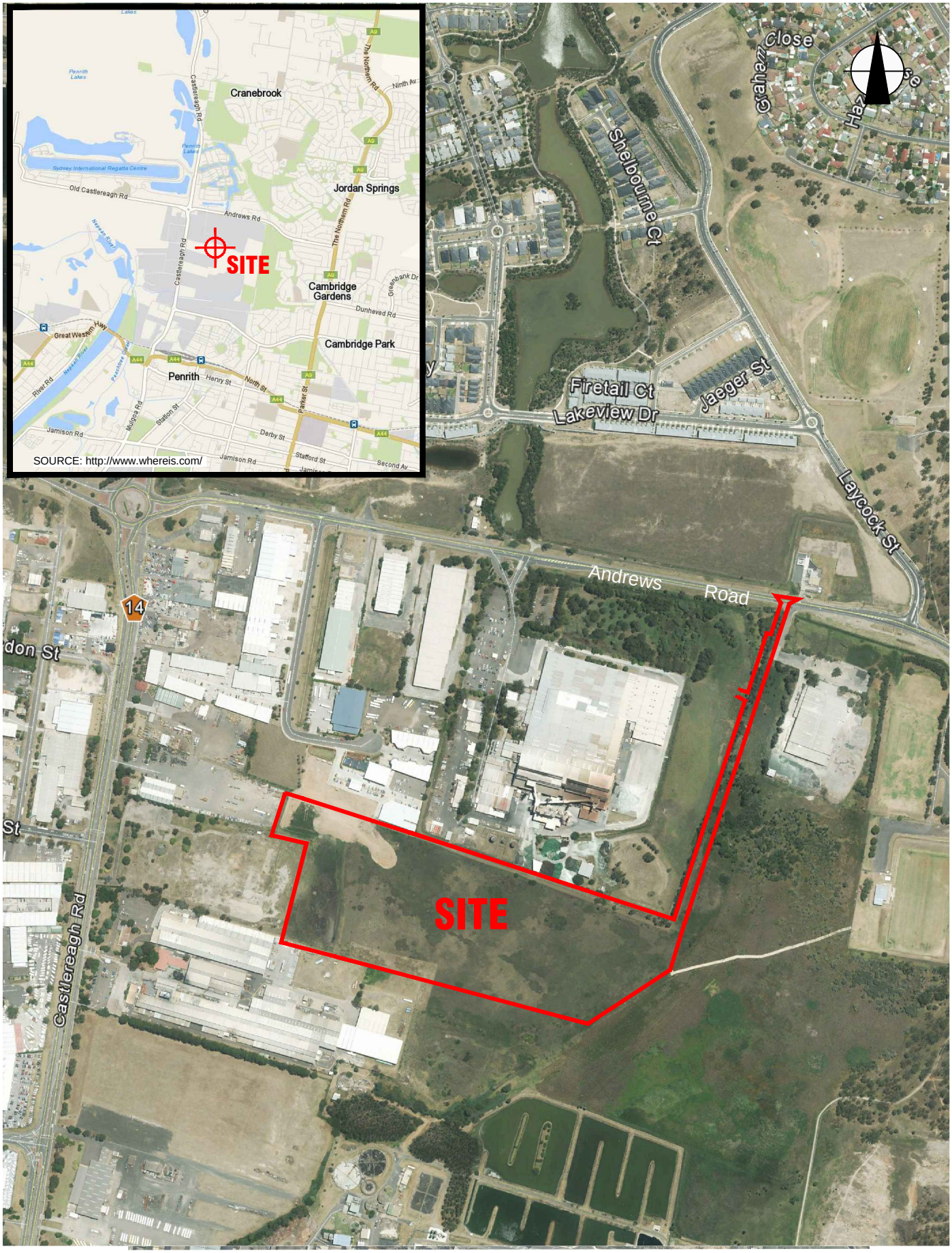
Kind Regards

Adrian Kingswell
Principal

Vittal Boggaram
Principal Associate

Attachments:
Figures
Tables
Laboratory Reports
Borehole Logs
Field Documents

Figures



AERIAL IMAGE SOURCE: GOOGLE EARTH PRO 7.1.5.1557
AERIAL IMAGE ©: 2015 GOOGLE INC.

This plan should be read in conjunction with the EIS report.

Title: **SITE LOCATION PLAN**

Location: 128 ANDREWS ROAD
PENRITH, NSW

Report No: E31675KR

Figure No: 1

ENVIRONMENTAL INVESTIGATION SERVICES

PLOT DATE: 4/10/2018 12:34:27 PM DWG FILE: S:\5 EIS\5C- EIS JOBS\31000'S\E31675KR PENRITH\CAD\E31675KR.DWG

LAMBRIDGE PLACE

3 x ASTs (CALTEX)

AST

BH188(0.65) BH184(0.4) BH177(1.0) BH189(>0.9) BH171(0.7) BH185(0.5) BH101(0.85) BH165(0.5) BH102(0.5) BH178(0.8) MW203(0.3) BH159(0.55) BH172(0.45) BH153(0.4) BH179(0.5) MW166(0.25) BH186(1.1) BH3(0.0) BH147(0.6) MW204(0.3) BH173(0.4) BH160(0.45) BH141(0.7) BH167(0.5) BH154(0.3) BH180(0.5) BH135(0.6) BH148(0.4) BH161(0.4) BH174(0.4) BH129(0.4) BH4(0.0) BH142(0.3) BH155(0.6) MW181(0.4) MW202(0.4) BH168(0.3) F2 BH123(0.35) BH136(0.35) BH149(0.4) BH162(0.4) BH5(0.0) BH130(0.45) BH117(0.6) BH175(0.4) BH143(0.3) BH111(0.5) BH182(0.7) BH156(0.4) BH124(0.3) MW137(0.5) BH107(0.45) BH169(0.2) BH187(0.6) BH150(0.3) BH1(0.0) BH118(0.5) BH131(0.35) BH104(0.4) BH163(0.35) BH144(0.4) BH112(0.4) BH183(0.5) BH157(0.3) BH125(0.5) BH138(0.4) BH108(0.4) BH176(1.0) MW170(0.5) BH151(0.3) BH119(0.5) MW201(0.4) BH132(0.4) BH105(0.2) SW1 BH145(0.2) BH113(0.4) SS1 BH164(0.4) BH126(0.4) BH158(0.4) BH139(0.7) BH120(0.4) BH109(0.3) BH133(0.4) BH106(0.3) BH152(0.35) BH2(0.0) BH114(0.6) BH127(0.3) BH110(0.5) BH146(0.35) BH140(0.4) BH121(0.7) BH134(0.35) BH115(0.4) BH128(0.25) BH122(0.4) BH116(0.65) BH103(0.4)

AERIAL IMAGE SOURCE: NEARMAP.COM, 08 APR 2018.

LEGEND

- APPROXIMATE SITE BOUNDARY
- BH (Fill Depth) — BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m), (EIS AUG 2018)
- MW137(Fill Depth) — GROUND WATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m), (EIS AUG 2018)
- MW201(Fill Depth) — GROUND WATER MONITORING WELL LOCATION, NUMBER AND DEPTH OF FILL (m), (EIS 5 & 6 NOV 2018)
- BH (Fill Depth) — BOREHOLE LOCATION, NUMBER AND DEPTH OF FILL (m), (JK GEOTECHNICS JULY 2018)
- STOCKPILE (SP)
- SW — SURFACE WATER SAMPLE
- SS — SURFACE SAMPLE
- F — FIBRE CEMENT FRAGMENT

0 20 40 60 80 100

SCALE 1:2000 @A3 METRES

This plan should be read in conjunction with the EIS report.

Title: **SAMPLE LOCATION PLAN**

Location: 128 ANDREWS ROAD PENRITH, NSW

Report No: E31675KR

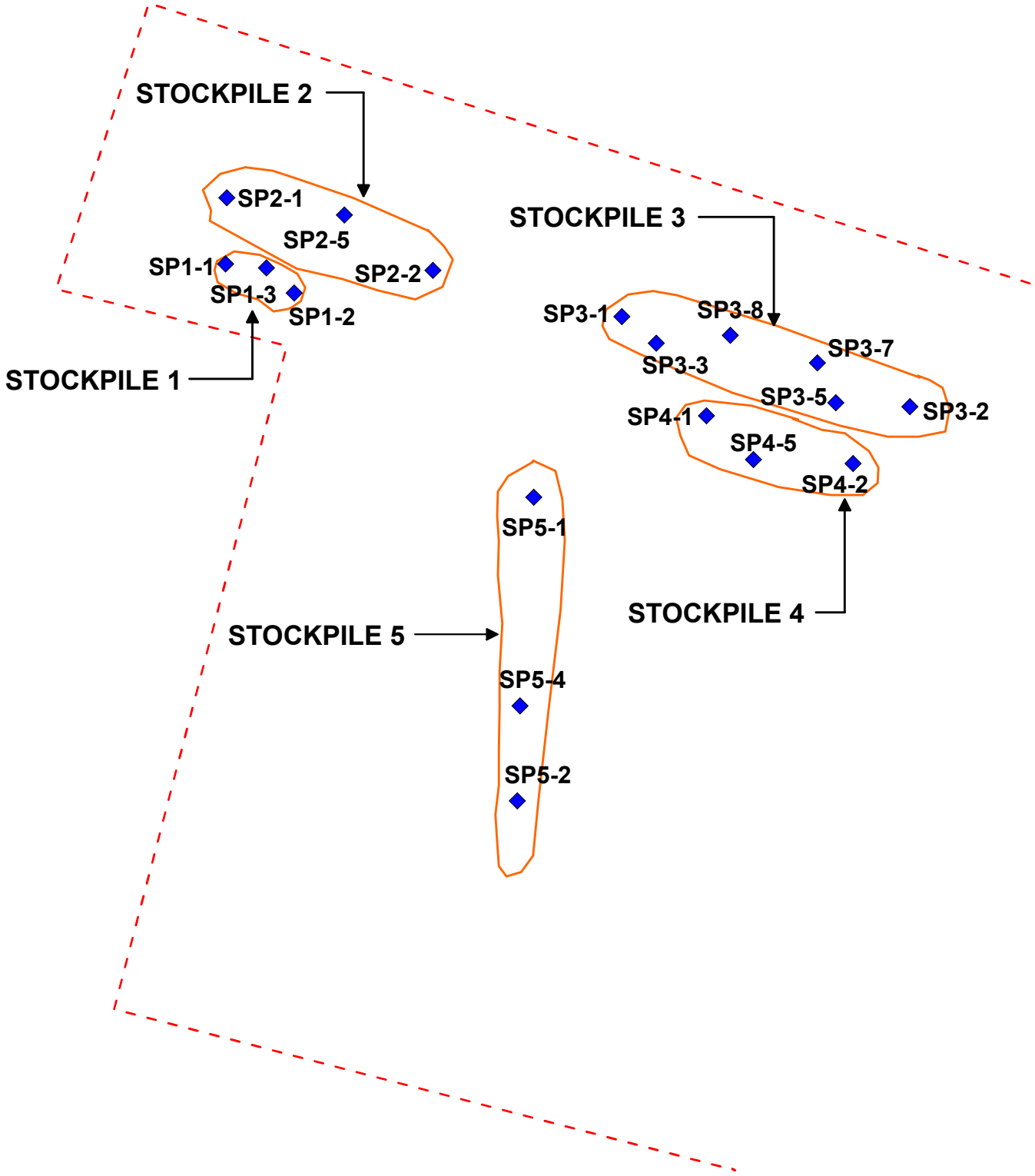
Figure No: 2

ENVIRONMENTAL INVESTIGATION SERVICES

EIS

DWG FILE: S:\S EIS\SC EIS JOBS\31000'S\E31675KR PENRITH\CAD\E31675KR.DWG

PLOT DATE: 14/11/2018 4:01:15 PM



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This plan should be read in conjunction with the report.

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STOCKPILE SAMPLE LOCATION PLAN

128 ANDREWS ROAD, PENRITH

PROJECT ID: E31675KR

F3

Summary Tables

ABBREVIATIONS AND EXPLANATIONS

Abbreviations used in the Tables:

ABC: Ambient Background Concentration
ACM: Asbestos Containing Material
ADWG: AustralianDrinking Water Guidelines
AF: Asbestos Fines
ANZECC: Australian and New Zealand Environment Conservation Council
B(a)P: Benzo(a)pyrene
CEC: Cation Exchange Capacity
CRC: Cooperative Research Centre
CT: Contaminant Threshold
EILs: Ecological Investigation Levels
ESLs: Ecological Screening Levels
FA: Fibrous Asbestos
GIL: Groundwater Investigation Levels
HILs: Health Investigation Levels
HSLs: Health Screening Levels
HSL-SSA: Health Screening Level-SiteSpecific Assessment
NA: Not Analysed
NC: Not Calculated
NEPM: National Environmental Protection Measure
NHMRC: National Health and Medical Research Council
NL: Not Limiting
NSL: No Set Limit
OCP: Organochlorine Pesticides
OPP: Organophosphorus Pesticides
PAHs: Polycyclic Aromatic Hydrocarbons
ppm: Parts per million
PCBs: Polychlorinated Biphenyls
PCE: Perchloroethylene (Tetrachloroethylene or Teterachloroethene)
pH_{KCL} : pH of filtered 1:20, 1M KCL extract, shaken overnight
pH_{ox} : pH of filtered 1:20 1M KCl after peroxide digestion
PQL: Practical Quantitation Limit
RS: Rinsate Sample
RSL: Regional Screening Levels
SAC: Site Assessment Criteria
SCC: Specific Contaminant Concentration
S_{Cr}: Chromium reducible sulfur
S_{POS}: Peroxide oxidisable Sulfur
SSA: Site Specific Assessment
SSHSLs: Site Specific Health Screening Levels
TAA: Total Actual Acidity in 1M KCL extract titrated to pH6.5
TB: Trip Blank
TCA: 1,1,1 Trichloroethane (methyl chloroform)
TCE: Trichloroethylene (Trichloroethene)
TCLP: Toxicity Characteristics Leaching Procedure
TPA: Total Potential Acidity, 1M KCL peroxide digest
TS: Trip Spike
TRH: Total Recoverable Hydrocarbons
TSA: Total Sulfide Acidity (TPA-TAA)
UCL: Upper Level Confidence Limit on Mean Value
USEPA United States Environmental Protection Age
VOCC: Volatile Organic Chlorinated Compounds
WHO: World Health Organisation

Table Specific Explanations:

HIL Tables:

- The chromium results are for Total Chromium which includes Chromium III and VI. For initial screening purposes, we have assumed that the samples contain only Chromium VI unless demonstrated otherwise by additional analysis.
- Carcinogenic PAHs is a toxicity weighted sum of analyte concentrations for a specific list of PAH compounds relative to B(a)P. It is also refered to as the B(a)P Toxic Equivalence Quotient (TEQ).
- Statistical calculations are undertaken using ProUCL (USEPA). Statistical calculation is usually undertaken using data from fill samples.

EIL/ESL Table:

- ABC Values for selected metals have been adopted from the published background concentrations presented in Olszowy et. al., (1995), Trace Element Concentrations in Soils from Rural and Urban New South Wales (the 25th percentile values for old suburbs with high traffic have been quoted).

Waste Classification and TCLP Table:

- Data assessed using the NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste (2014).
- The assessment of Total Moderately Harmful pesticides includes: Dichlorovos, Dimethoate, Fenitrothion, Ethion, Malathion and Parathion.
- Assessment of Total Scheduled pesticides include: HBC, alpha-BHC, gamma-BHC, beta-BHC, Heptachlor, Aldrin, Heptachlor Epoxide, gamma-Chlordane, alpha-chlordane, pp-DDE, Dieldrin, Endrin, pp-DDD, pp-DDT, Endrin Aldehyde.

TABLE A
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013.
HIL-D: 'Commercial/Industrial'

All data in mg/kg unless stated otherwise			HEAVY METALS								PAHs		ORGANOCHLORINE PESTICIDES (OCPs)							OP PESTICIDES (OPPs)	TOTAL PCBs	ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium VI	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	Carcinogenic PAHs	HCB	Endosulfan	Methoxychlor	Aldrin & Dieldrin	Chlordane	DDT, DDD & DDE	Heptachlor	Chlorpyrifos		
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100
Site Assessment Criteria (SAC)			3000	900	3600	240000	1500	730	6000	400000	4000	40	80	2000	2500	45	530	3600	50	2000	7	Detected/Not Detected
Sample Reference	**Sample Depth**	**Sample Description**																				
SP1-1	Stockpile	Fill	<4	<0.4	12	77	21	<0.1	8	77	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP1-2	Stockpile	Fill	<4	<0.4	14	31	12	<0.1	8	42	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP2-1	Stockpile	Fill	<4	<0.4	12	27	25	<0.1	7	42	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP2-2	Stockpile	Fill	<4	<0.4	12	18	25	<0.1	9	42	1.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP3-1	Stockpile	Fill	<4	<0.4	16	61	13	<0.1	21	47	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP3-2	Stockpile	Fill	<4	<0.4	35	57	19	<0.1	39	95	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP4-1	Stockpile	Fill	<4	<0.4	23	31	13	<0.1	24	38	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP4-2	Stockpile	Fill	4	<0.4	19	27	17	<0.1	24	39	0.3	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP5-1	Stockpile	Fill	<4	0.7	10	100	18	<0.1	5	200	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP5-2	Stockpile	Fill	<4	2	42	290	41	<0.1	8	550	0.07	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP1-3	Stockpile	Fill	<4	<0.4	49	66	16	<0.1	42	83	0.4	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP2-5	Stockpile	Fill	<4	<0.4	23	35	11	<0.1	41	52	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP3-3	Stockpile	Fill	<4	<0.4	17	27	13	<0.1	21	51	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP3-5	Stockpile	Fill	<4	<0.4	15	15	11	<0.1	16	40	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP3-7	Stockpile	Fill	<4	<0.4	20	34	14	<0.1	29	73	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP3-8	Stockpile	Fill	<4	<0.4	54	55	16	<0.1	49	90	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP4-5	Stockpile	Fill	<4	<0.4	15	22	15	<0.1	14	42	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
SP5-4	Stockpile	Fill	<4	<0.4	20	32	13	<0.1	25	59	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	Not Detected
DUP PB-1	Stockpile	Fill	<4	<0.4	23	39	13	<0.1	30	60	<0.05	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NA
Total Number of Samples			19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	18
Maximum Value			4	2	54	290	41	<PQL	49	550	1.5	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	NC
Statistical Analysis on Fill Samples																						
Number of Fill Samples			NC	NC	19	19	19	NC	19	19	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mean Value			NC	NC	23	55	17	NC	22	91	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Standard Deviation			NC	NC	12.9	61.1	7.1	NC	13.5	117.4	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
% UCL			NC	NC	95	95	95	NC	95	95	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
UCL Value			NC	NC	28.5	74.4	20	NC	27.5	208	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Concentration above the SAC **VALUE**

TABLE B
SOIL LABORATORY RESULTS COMPARED TO HSLs
All data in mg/kg unless stated otherwise

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Field PID Measurement
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1	ppm
NEPM 2013 HSL Land Use Category					**HSL-D: COMMERCIAL/INDUSTRIAL**							
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**								
SP1-1	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
SP1-2	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
SP2-1	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
SP2-2	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
SP3-1	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
SP3-2	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
SP4-1	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
SP4-2	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
SP5-1	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
SP5-2	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0.1
SP1-3	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
SP2-5	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
SP3-3	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
SP3-5	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
SP3-7	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
SP3-8	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
SP4-5	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
SP5-4	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
DUP PB-1	Stockpile	Fill	0m to < 1m	Clay	<25	<50	<0.2	<0.5	<1	<1	<1	0
Total Number of Samples					19	19	19	19	19	19	19	19
Maximum Value					<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	0.1

Concentration above the SAC **VALUE**

The guideline corresponding to the elevated value is highlighted in grey in the Site Assessment Criteria Table below

SITE ASSESSMENT CRITERIA

					C_6-C_{10} (F1)	>C_{10}-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
PQL - Envirolab Services					25	50	0.2	0.5	1	1	1
NEPM 2013 HSL Land Use Category					**HSL-D: COMMERCIAL/INDUSTRIAL**						
Sample Reference	**Sample Depth**	**Sample Description**	**Depth Category**	**Soil Category**							
SP1-1	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP1-2	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP2-1	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP2-2	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP3-1	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP3-2	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP4-1	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP4-2	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP5-1	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP5-2	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP1-3	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP2-5	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP3-3	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP3-5	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP3-7	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP3-8	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP4-5	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
SP5-4	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL
DUP PB-1	Stockpile	Fill	0m to < 1m	Clay	310	NL	4	NL	NL	NL	NL

Additional Investigation
128 Andrews Road, Penrith
E31675KR add

EIS

TABLE C
SOIL LABORATORY RESULTS COMPARED TO NEPM 2013 EILs AND ESLs
All data in mg/kg unless stated otherwise

Land Use Category				COMMERCIAL/INDUSTRIAL																	
							AGED HEAVY METALS-EILs						EILs		ESLs						
				pH	CEC ($cmol_c/kg$)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	$>C_{10}$-C_{16} (F2)	$>C_{16}$-C_{34} (F3)	$>C_{34}$-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	0.1	0.1	25	50	100	100	0.2	0.5	1	3	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	13	28	163	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
SP1-1	Stockpile	Fill	Fine	6.3	8	18.3	<4	12	77	21	8	77	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
SP1-2	Stockpile	Fill	Fine	6.3	8	18.3	<4	14	31	12	8	42	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
SP2-1	Stockpile	Fill	Fine	6.3	8	18.3	<4	12	27	25	7	42	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
SP2-2	Stockpile	Fill	Fine	6.3	8	18.3	<4	12	18	25	9	42	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.2
SP3-1	Stockpile	Fill	Fine	6.3	8	18.3	<4	16	61	13	21	47	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
SP3-2	Stockpile	Fill	Fine	6.3	8	18.3	<4	35	57	19	39	95	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
SP4-1	Stockpile	Fill	Fine	6.3	8	18.3	<4	23	31	13	24	38	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
SP4-2	Stockpile	Fill	Fine	6.3	8	18.3	4	19	27	17	24	39	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.06
SP5-1	Stockpile	Fill	Fine	6.3	8	18.3	<4	10	100	18	5	200	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
SP5-2	Stockpile	Fill	Fine	6.3	8	18.3	<4	42	290	41	8	550	<0.1	<0.1	<25	<50	560	<100	<0.2	<0.5	<1	<3	0.07
SP1-3	Stockpile	Fill	Fine	6.3	8	18.3	<4	49	66	16	42	83	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.06
SP2-5	Stockpile	Fill	Fine	6.3	8	18.3	<4	23	35	11	41	52	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
SP3-3	Stockpile	Fill	Fine	6.3	8	18.3	<4	17	27	13	21	51	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
SP3-5	Stockpile	Fill	Fine	6.3	8	18.3	<4	15	15	11	16	40	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
SP3-7	Stockpile	Fill	Fine	6.3	8	18.3	<4	20	34	14	29	73	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
SP3-8	Stockpile	Fill	Fine	6.3	8	18.3	<4	54	55	16	49	90	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
SP4-5	Stockpile	Fill	Fine	6.3	8	18.3	<4	15	22	15	14	42	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
SP5-4	Stockpile	Fill	Fine	6.3	8	18.3	<4	20	32	13	25	59	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
DUP PB-1	Stockpile	Fill	Fine	6.3	8	18.3	<4	23	39	13	30	60	<0.1	<0.1	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.05
Total Number of Samples				19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Maximum Value				6.3	8	18.3	4	54	290	41	49	550	<PQL	<PQL	<PQL	<PQL	560	<PQL	<PQL	<PQL	<PQL	<PQL	0.2

Concentration above the SAC VALUE

The guideline corresponding to the elevated value is highlighted in grey in the EIL and ESL Assessment Criteria Table below

EIL AND ESL ASSESSMENT CRITERIA

Land Use Category				COMMERCIAL/INDUSTRIAL																	
							AGED HEAVY METALS-EILs						EILs		ESLs						
				pH	CEC ($cmol_c/kg$)	Clay Content (% clay)	Arsenic	Chromium	Copper	Lead	Nickel	Zinc	Naphthalene	DDT	C_6-C_{10} (F1)	$>C_{10}$-C_{16} (F2)	$>C_{16}$-C_{34} (F3)	$>C_{34}$-C_{40} (F4)	Benzene	Toluene	Ethylbenzene	Total Xylenes	B(a)P
PQL - Envirolab Services				-	1	-	4	1	1	1	1	1	0.1	0.1	25	50	100	100	0.2	0.5	1	3	0.05
Ambient Background Concentration (ABC)				-	-	-	NSL	13	28	163	5	122	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL	NSL
Sample Reference	**Sample Depth**	**Sample Description**	**Soil Texture**																				
SP1-1	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP1-2	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP2-1	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP2-2	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP3-1	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP3-2	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP4-1	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP4-2	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP5-1	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP5-2	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP1-3	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP2-5	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP3-3	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP3-5	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP3-7	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP3-8	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP4-5	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
SP5-4	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172
DUP PB-1	Stockpile	Fill	Fine	6.3	8	18.3	160	673	308	1963	295	742	370	640	215	170	2500	6600	95	135	185	95	172

Additional Investigation
128 Andrews Road, Penrith
E31675KR add

EIS

TABLE D
SOIL LABORATORY RESULTS COMPARED TO WASTE CLASSIFICATION GUIDELINES
All data in mg/kg unless stated otherwise

			HEAVY METALS								PAHs		OC/OP PESTICIDES				Total PCBs	TRH					BTEX COMPOUNDS				ASBESTOS FIBRES
			Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	Total PAHs	B(a)P	Total Endosulfans	Chloropyrifos	Total Moderately Harmful	Total Scheduled		C_6-C_9	C_{10}-C_{14}	C_{15}-C_{28}	C_{29}-C_{36}	Total C_{10}-C_{36}	Benzene	Toluene	Ethyl benzene	Total Xylenes	
PQL - Envirolab Services			4	0.4	1	1	1	0.1	1	1	-	0.05	0.1	0.1	0.1	0.1	0.1	25	50	100	100	250	0.2	0.5	1	3	100
General Solid Waste CT1			100	20	100	NSL	100	4	40	NSL	200	0.8	60	4	250	<50	<50	650		NSL		10,000	10	288	600	1,000	-
General Solid Waste SCC1			500	100	1900	NSL	1500	50	1050	NSL	200	10	108	7.5	250	<50	<50	650		NSL		10,000	18	518	1,080	1,800	-
Restricted Solid Waste CT2			400	80	400	NSL	400	16	160	NSL	800	3.2	240	16	1000	<50	<50	2600		NSL		40,000	40	1,152	2,400	4,000	-
Restricted Solid Waste SCC2			2000	400	7600	NSL	6000	200	4200	NSL	800	23	432	30	1000	<50	<50	2600		NSL		40,000	72	2,073	4,320	7,200	-
Sample Reference	**Sample Depth**	**Sample Description**																									
SP1-1	Stockpile	Fill	<4	<0.4	12	77	21	<0.1	8	77	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
SP1-2	Stockpile	Fill	<4	<0.4	14	31	12	<0.1	8	42	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
SP2-1	Stockpile	Fill	<4	<0.4	12	27	25	<0.1	7	42	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
SP2-2	Stockpile	Fill	<4	<0.4	12	18	25	<0.1	9	42	1.5	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
SP3-1	Stockpile	Fill	<4	<0.4	16	61	13	<0.1	21	47	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
SP3-2	Stockpile	Fill	<4	<0.4	35	57	19	<0.1	39	95	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
SP4-1	Stockpile	Fill	<4	<0.4	23	31	13	<0.1	24	38	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
SP4-2	Stockpile	Fill	4	<0.4	19	27	17	<0.1	24	39	0.3	0.06	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
SP5-1	Stockpile	Fill	<4	0.7	10	100	18	<0.1	5	200	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
SP5-2	Stockpile	Fill	<4	2	42	290	41	<0.1	8	550	0.07	0.07	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	260	350	610	<0.2	<0.5	<1	<3	Not Detected
SP1-3	Stockpile	Fill	<4	<0.4	49	66	16	<0.1	**42**	83	0.4	0.06	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
SP2-5	Stockpile	Fill	<4	<0.4	23	35	11	<0.1	**41**	52	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
SP3-3	Stockpile	Fill	<4	<0.4	17	27	13	<0.1	21	51	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
SP3-5	Stockpile	Fill	<4	<0.4	15	15	11	<0.1	16	40	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
SP3-7	Stockpile	Fill	<4	<0.4	20	34	14	<0.1	29	73	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
SP3-8	Stockpile	Fill	<4	<0.4	54	55	16	<0.1	**49**	90	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
SP4-5	Stockpile	Fill	<4	<0.4	15	22	15	<0.1	14	42	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
SP5-4	Stockpile	Fill	<4	<0.4	20	32	13	<0.1	25	59	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
DUP PB-1	Stockpile	Fill	<4	<0.4	23	39	13	<0.1	30	60	<0.05	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<PQL	<0.2	<0.5	<1	<3	Not Detected
Total Number of samples			19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Maximum Value			4	2	54	290	41	<PQL	49	550	1.5	0.2	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	260	350	610	<PQL	<PQL	<PQL	<PQL	NC
Statistical Analysis on Fill Samples																											
Number of Fill Samples			NC	NC	19	19	19	NC	19	19	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Mean Value			NC	NC	23	55	17	NC	22	91	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
Standard Deviation			NC	NC	12.9	61.1	7.1	NC	13.5	117.4	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
% UCL			NC	NC	95	95	95	NC	95	95	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC
UCL Value			NC	NC	28.5	74.4	20	NC	27.5	208	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC

Concentration above the CT1 — **VALUE**
Concentration above SCC1 — **VALUE**
Concentration above the SCC2 — **VALUE**

TABLE E
GROUNDWATER LABORATORY RESULTS COMPARED TO HSLs
All data in µg/L unless stated otherwise

				C_6-C_{10} (F1)	$>C_{10}$-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	PID
PQL - Envirolab Services				10	50	1	1	1	3	1	
NEPM 2013 - Land Use Category				**HSL-D: COMMERCIAL/INDUSTRIAL**							
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**								
MW201	7.1	4m to <8m	Clay	<10	<50	<1	<1	<1	<1	<1	3
MW202	6.8	4m to <8m	Clay	<10	<50	<1	<1	<1	<1	<1	0.6
MW203	7.45	4m to <8m	Clay	<10	<50	<1	<1	<1	<1	<1	0.2
MW204	7.7	4m to <8m	Clay	<10	<50	<1	<1	<1	<1	<1	0.4
Total Number of Samples				4	4	4	4	4	4	4	4
Maximum Value				<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	<PQL	3

Concentration above the SAC — VALUE
Site specific assesment (SSA) required — VALUE

The guideline corresponding to the elevated value is highlighted in grey in the Site Assessment Criteria Table below

HSL GROUNDWATER ASSESSMENT CRITERIA

				C_6-C_{10} (F1)	$>C_{10}$-C_{16} (F2)	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene
PQL - Envirolab Services				10	50	1	1	1	3	1
NEPM 2013 - Land Use Category				**HSL-D: COMMERCIAL/INDUSTRIAL**						
Sample Reference	**Water Depth**	**Depth Category**	**Soil Category**							
MW201	7.1	4m to <8m	Clay	NL	NL	30000	NL	NL	NL	NL
MW202	6.8	4m to <8m	Clay	NL	NL	30000	NL	NL	NL	NL
MW203	7.45	4m to <8m	Clay	NL	NL	30000	NL	NL	NL	NL
MW204	7.7	4m to <8m	Clay	NL	NL	30000	NL	NL	NL	NL

Additional Investigation
128 Andrews Road, Penrith
E31675KR add

TABLE F
SUMMARY OF GROUNDAWATER LABORATORY RESULTS COMPARED TO ECOLOGICAL GILs SAC
All results in µg/L unless stated otherwise.

	PQL Envirolab Services	ANZECC 2000 Fresh Waters	SAMPLES			
			MW201	MW202	MW203	MW204
Inorganic Compounds and Parameters						
pH	0.1	6.5 - 8.5	7	6.8	6.4	6.7
Electrical Conductivity (µS/cm)	1	NSL	490	340	530	360
Non-Metallic Inorganics						
Ammonia (as NH_3-N at pH 7)	0.1	2180	<0.005	<0.005	150	<0.005
Metals and Metalloids						
Arsenic (As lll)	1	24	<1	<1	<1	<1
Cadmium	0.1	0.2	<0.1	<0.1	<0.1	<0.1
Chromium (SAC for Cr III adopted)	1	3.3	<1	<1	<1	<1
Copper	1	1.4	<1	<1	<1	<1
Lead	1	3.4	<1	<1	<1	<1
Total Mercury (inorganic)	0.05	0.06	<0.05	<0.05	<0.05	<0.05
Nickel	1	11	<1	<1	<1	<1
Zinc	1	8	6	7	5	2
Monocyclic Aromatic Hydrocarbons (BTEX Compounds)						
Benzene	1	950	<1	<1	<1	<1
Toluene	1	180	<1	<1	<1	<1
Ethylbenzene	1	80	<1	<1	<1	<1
m+p-xylene	2	75	<2	<2	<2	<2
o-xylene	1	350	<1	<1	<1	<1
Total xylenes	2	NSL	<3	<3	<3	<3
Volatile Organic Compounds (VOCs), including chlorinated VOCs						
Dichlorodifluoromethane	10	NSL	<10	<10	<10	<10
Chloromethane	10	NSL	<10	<10	<10	<10
Vinyl Chloride	10	100	<10	<10	<10	<10
Bromomethane	10	NSL	<10	<10	<10	<10
Chloroethane	10	NSL	<10	<10	<10	<10
Trichlorofluoromethane	10	NSL	<10	<10	<10	<10
1,1-Dichloroethene	1	700	<1	<1	<1	<1
Trans-1,2-dichloroethene	1	NSL	<1	<1	<1	<1
1,1-dichloroethane	1	90	<1	<1	<1	<1
Cis-1,2-dichloroethene	1	NSL	<1	<1	<1	<1
Bromochloromethane	1	NSL	<1	<1	<1	<1
Chloroform	1	370	<1	<1	<1	<1
2,2-dichloropropane	1	NSL	<1	<1	<1	<1
1,2-dichloroethane	1	1900	<1	<1	<1	<1
1,1,1-trichloroethane	1	270	<1	<1	<1	<1
1,1-dichloropropene	1	NSL	<1	<1	<1	<1
Cyclohexane	1	NSL	<1	<1	<1	<1
Carbon tetrachloride	1	240	<1	<1	<1	<1
Benzene	1	see BTEX	<1	<1	<1	<1
Dibromomethane	1	NSL	<1	<1	<1	<1
1,2-dichloropropane	1	900	<1	<1	<1	<1
Trichloroethene	1	NSL	<1	<1	<1	<1
Bromodichloromethane	1	NSL	<1	<1	<1	<1
trans-1,3-dichloropropene	1	NSL	<1	<1	<1	<1
cis-1,3-dichloropropene	1	NSL	<1	<1	<1	<1
1,1,2-trichloroethane	1	6500	<1	<1	<1	<1
Toluene	1	see BTEX	<1	<1	<1	<1
1,3-dichloropropane	1	1100	<1	<1	<1	<1
Dibromochloromethane	1	NSL	<1	<1	<1	<1
1,2-dibromoethane	1	NSL	<1	<1	<1	<1
Tetrachloroethene	1	70	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	1	NSL	<1	<1	<1	<1
Chlorobenzene	1	55	<1	<1	<1	<1
Ethylbenzene	1	see BTEX	<1	<1	<1	<1
Bromoform	1	NSL	<1	<1	<1	<1
m+p-xylene	2	see BTEX	<2	<2	<2	<2
Styrene	1	NSL	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	1	400	<1	<1	<1	<1
o-xylene	1	see BTEX	<1	<1	<1	<1
1,2,3-trichloropropane	1	NSL	<1	<1	<1	<1
Isopropylbenzene	1	30	<1	<1	<1	<1
Bromobenzene	1	NSL	<1	<1	<1	<1
n-propyl benzene	1	NSL	<1	<1	<1	<1
2-chlorotoluene	1	NSL	<1	<1	<1	<1
4-chlorotoluene	1	NSL	<1	<1	<1	<1
1,3,5-trimethyl benzene	1	NSL	<1	<1	<1	<1
Tert-butyl benzene	1	NSL	<1	<1	<1	<1
1,2,4-trimethyl benzene	1	NSL	<1	<1	<1	<1
1,3-dichlorobenzene	1	260	<1	<1	<1	<1
Sec-butyl benzene	1	NSL	<1	<1	<1	<1
1,4-dichlorobenzene	1	60	<1	<1	<1	<1
4-isopropyl toluene	1	NSL	<1	<1	<1	<1
1,2-dichlorobenzene	1	160	<1	<1	<1	<1
n-butyl benzene	1	NSL	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	1	NSL	<1	<1	<1	<1
1,2,4-trichlorobenzene	1	85	<1	<1	<1	<1
Hexachlorobutadiene	1	NSL	<1	<1	<1	<1
1,2,3-trichlorobenzene	1	3	<1	<1	<1	<1
Polycyclic Aromatic Hydrocarbons (PAHs)						
Naphthalene	0.2	16	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1
Acenaphthene	0.1	NSL	<0.1	<0.1	<0.1	<0.1
Fluorene	0.1	NSL	<0.1	<0.1	<0.1	<0.1
Phenanthrene	0.1	0.6	<0.1	<0.1	<0.1	<0.1
Anthracene	0.1	0.01	<0.1	<0.1	<0.1	<0.1
Fluoranthene	0.1	1	<0.1	<0.1	<0.1	<0.1
Pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1
Chrysene	0.1	NSL	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	0.2	NSL	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	0.1	0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	0.1	NSL	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	0.1	NSL	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	0.1	NSL	<0.1	<0.1	<0.1	<0.1

Concentration above the GIL — VALUE
PQL exceeds GIL — **BOLD/RED**

Additional Investigation
128 Andrews Road, Penrith
E31675KR add

TABLE G
SOIL INTRA-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS
All results in mg/kg unless stated otherwise

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = SP1-3	Arsenic	4	<4	<4	NC	NC
Dup Ref = PB-1	Cadmium	0.4	<0.4	<0.4	NC	NC
	Chromium	1	49	23	36.0	72
Envirolab Report: 205182	Copper	1	66	39	52.5	51
	Lead	1	16	13	14.5	21
	Mercury	0.1	<0.1	<0.1	NC	NC
	Nickel	1	42	30	36.0	33
	Zinc	1	83	60	71.5	32
	Naphthalene	0.1	<0.1	<0.1	NC	NC
	Acenaphthylene	0.1	<0.1	<0.1	NC	NC
	Acenaphthene	0.1	<0.1	<0.1	NC	NC
	Fluorene	0.1	<0.1	<0.1	NC	NC
	Phenanthrene	0.1	0.1	<0.1	0.1	67
	Anthracene	0.1	<0.1	<0.1	NC	NC
	Fluoranthene	0.1	0.1	<0.1	0.1	67
	Pyrene	0.1	0.1	<0.1	0.1	67
	Benzo(a)anthracene	0.1	<0.1	<0.1	NC	NC
	Chrysene	0.1	<0.1	<0.1	NC	NC
	Benzo(b,j+k)fluoranthene	0.2	<0.2	<0.2	NC	NC
	Benzo(a)pyrene	0.05	0.06	<0.05	0.0	82
	Indeno(123-cd)pyrene	0.1	<0.1	<0.1	NC	NC
	Dibenzo(ah)anthracene	0.1	<0.1	<0.1	NC	NC
	Benzo(ghi)perylene	0.1	<0.1	<0.1	NC	NC
	Total OCPs	0.1	<0.1	<0.1	NC	NC
	Total OPPs	0.1	<0.1	<0.1	NC	NC
	Total PCBs	0.1	<0.1	<0.1	NC	NC
	TRH C_6-C_{10} (F1)	25	<25	<25	NC	NC
	TRH >C_{10}-C_{16} (F2)	50	<50	<50	NC	NC
	TRH >C_{16}-C_{34} (F3)	100	<100	<100	NC	NC
	TRH >C_{34}-C_{40} (F4)	100	<100	<100	NC	NC
	Benzene	0.2	<0.2	<0.2	NC	NC
	Toluene	0.5	<0.5	<0.5	NC	NC
	Ethylbenzene	1	<1	<1	NC	NC
	m+p-xylene	2	<2	<2	NC	NC
	o-xylene	1	<1	<1	NC	NC

Explanation:

The RPD value is calculated as the absolute value of the difference between the initial and repeat results divided by the average value expressed as a percentage. The following acceptance criteria will be used to assess the RPD results:

Results > 10 times PQL = RPD value <= 50% are acceptable
Results between 5 & 10 times PQL = RPD value <= 75% are acceptable
Results < 5 times PQL = RPD value <= 100% are acceptable

If result is LPQL then 50% of the PQL is used for the calculation

RPD Results Above the Acceptance Criteria VALUE

Additional Investigation
128 Andrews Road, Penrith
E31675KR add

TABLE H
GROUNDWATER INTRA-LABORATORY DUPLICATE RESULTS & RPD CALCULATIONS
All results in µg/L unless stated otherwise

SAMPLE	ANALYSIS	Envirolab PQL	INITIAL	REPEAT	MEAN	RPD %
Sample Ref = MW204	Arsenic	1	<1	<1	NC	NC
Dup Ref = DUP MP1	Cadmium	0.1	<0.1	<0.1	NC	NC
	Chromium	1	<1	<1	NC	NC
Envirolab Report: 205400	Copper	1	<1	<1	NC	NC
	Lead	1	<1	<1	NC	NC
	Mercury	0.05	<0.05	<0.05	NC	NC
	Nickel	1	<1	1	1	67
	Zinc	1	2	4	3	67
	Naphthalene	0.2	<0.2	<0.2	NC	NC
	Acenaphthylene	0.1	<0.1	<0.1	NC	NC
	Acenaphthene	0.1	<0.1	<0.1	NC	NC
	Fluorene	0.1	<0.1	<0.1	NC	NC
	Phenanthrene	0.1	<0.1	<0.1	NC	NC
	Anthracene	0.1	<0.1	<0.1	NC	NC
	Fluoranthene	0.1	<0.1	<0.1	NC	NC
	Pyrene	0.1	<0.1	<0.1	NC	NC
	Benzo(a)anthracene	0.1	<0.1	<0.1	NC	NC
	Chrysene	0.1	<0.1	<0.1	NC	NC
	Benzo(b,j+k)fluoranthene	0.2	<0.2	<0.2	NC	NC
	Benzo(a)pyrene	0.1	<0.1	<0.1	NC	NC
	Indeno(123-cd)pyrene	0.1	<0.1	<0.1	NC	NC
	Dibenzo(ah)anthracene	0.1	<0.1	<0.1	NC	NC
	Benzo(ghi)perylene	0.1	<0.1	<0.1	NC	NC
	Total VOCs	0.1	<0.1	<0.1	NC	NC
	TRH C6-C10 (F1)	10	<10	<10	NC	NC
	TRH >C10-C16 (F2)	50	<50	<50	NC	NC
	TRH >C16-C34 (F3)	100	<100	<100	NC	NC
	TRH >C34-C40 (F4)	100	<100	<100	NC	NC
	Benzene	1	<1	<1	NC	NC
	Toluene	1	<1	<1	NC	NC
	Ethylbenzene	1	<1	<1	NC	NC
	m+p-xylene	2	<2	<2	NC	NC
	o-xylene	1	<1	<1	NC	NC

Explanation:

The RPD value is calculated as the absolute value of the difference between the initial and repeat results divided by the average value expressed as a percentage. The following acceptance criteria will be used to assess the RPD results:

Results > 10 times PQL = RPD value <= 50% are acceptable
Results between 5 & 10 times PQL = RPD value <= 75% are acceptable
Results < 5 times PQL = RPD value <= 100% are acceptable

If result is LPQL then 50% of the PQL is used for the calculation

RPD Results Above the Acceptance Criteria VALUE

Additional Investigation
128 Andrews Road, Penrith
E31675KR add

TABLE I
SUMMARY OF FIELD QA/QC RESULTS

ANALYSIS	PQL µg/L	TB[w] 12/11/2008 µg/L	TS1[w] 12/11/2018 % Recovery
TRH C6-C10 (F1)	10	<10	NA
Benzene	1	<1	107%
Toluene	1	<1	104%
Ethylbenzene	1	<1	107%
m+p-xylene	2	<2	109%
o-xylene	1	<1	109%

Explanation:
[w] Sample type (water)
BTEX concentrations in trip spikes are presented as % recovery

Values above PQLs/Acceptance criteria **VALUE**

Laboratory Reports

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CERTIFICATE OF ANALYSIS 205182

Client Details

Client	Environmental Investigation Services
Attention	Priya Dass
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31675KR, Penrith**
Number of Samples	19 soil
Date samples received	08/11/2018
Date completed instructions received	08/11/2018

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.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	13/11/2018
Date of Issue	13/11/2018

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Asbestos Approved By

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Results Approved By

Jeremy Faircloth, Organics Supervisor
Long Pham, Team Leader, Metals
Lucy Zhu, Asbsestos Analyst
Steven Luong, Senior Chemist

Authorised By

Jacinta Hurst, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		205182-1	205182-5	205182-6	205182-8	205182-10
Your Reference	UNITS	SP1-3	SP2-5	SP3-3	SP3-5	SP3-7
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Date analysed	-	12/11/2018	12/11/2018	12/11/2018	12/11/2018	12/11/2018
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	98	97	97	97	101

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		205182-11	205182-15	205182-17	205182-18
Your Reference	UNITS	SP3-8	SP4-5	SP5-4	DUP PB-1
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil
Date extracted	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Date analysed	-	12/11/2018	12/11/2018	12/11/2018	12/11/2018
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	102	98	97	98

svTRH (C10-C40) in Soil						
Our Reference		205182-1	205182-5	205182-6	205182-8	205182-10
Your Reference	UNITS	SP1-3	SP2-5	SP3-3	SP3-5	SP3-7
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Date analysed	-	10/11/2018	10/11/2018	10/11/2018	10/11/2018	10/11/2018
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	75	76	75	77	75

svTRH (C10-C40) in Soil					
Our Reference		205182-11	205182-15	205182-17	205182-18
Your Reference	UNITS	SP3-8	SP4-5	SP5-4	DUP PB-1
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil
Date extracted	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Date analysed	-	10/11/2018	10/11/2018	10/11/2018	10/11/2018
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	78	76	76	75

PAHs in Soil						
Our Reference		205182-1	205182-5	205182-6	205182-8	205182-10
Your Reference	UNITS	SP1-3	SP2-5	SP3-3	SP3-5	SP3-7
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Date analysed	-	12/11/2018	12/11/2018	12/11/2018	12/11/2018	12/11/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.06	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.4	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	90	91	91	93	92

PAHs in Soil					
Our Reference		205182-11	205182-15	205182-17	205182-18
Your Reference	UNITS	SP3-8	SP4-5	SP5-4	DUP PB-1
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil
Date extracted	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Date analysed	-	12/11/2018	12/11/2018	12/11/2018	12/11/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	91	90	91	87

Organochlorine Pesticides in soil						
Our Reference		205182-1	205182-5	205182-6	205182-8	205182-10
Your Reference	UNITS	SP1-3	SP2-5	SP3-3	SP3-5	SP3-7
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Date analysed	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018	09/11/2018
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	124	130	134	128	130

Organochlorine Pesticides in soil					
Our Reference		205182-11	205182-15	205182-17	205182-18
Your Reference	UNITS	SP3-8	SP4-5	SP5-4	DUP PB-1
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil
Date extracted	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Date analysed	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	108	105	103	102

Organophosphorus Pesticides						
Our Reference		205182-1	205182-5	205182-6	205182-8	205182-10
Your Reference	UNITS	SP1-3	SP2-5	SP3-3	SP3-5	SP3-7
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Date analysed	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	124	130	134	128	130

Organophosphorus Pesticides					
Our Reference		205182-11	205182-15	205182-17	205182-18
Your Reference	UNITS	SP3-8	SP4-5	SP5-4	DUP PB-1
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil
Date extracted	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Date analysed	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	108	105	103	102

PCBs in Soil						
Our Reference		205182-1	205182-5	205182-6	205182-8	205182-10
Your Reference	UNITS	SP1-3	SP2-5	SP3-3	SP3-5	SP3-7
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil	soil
Date extracted	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Date analysed	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	124	130	134	128	130

PCBs in Soil					
Our Reference		205182-11	205182-15	205182-17	205182-18
Your Reference	UNITS	SP3-8	SP4-5	SP5-4	DUP PB-1
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil
Date extracted	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Date analysed	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	108	105	103	102

Acid Extractable metals in soil						
Our Reference		205182-1	205182-5	205182-6	205182-8	205182-10
Your Reference	UNITS	SP1-3	SP2-5	SP3-3	SP3-5	SP3-7
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Date analysed	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	49	23	17	15	20
Copper	mg/kg	66	35	27	15	34
Lead	mg/kg	16	11	13	11	14
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	42	41	21	16	29
Zinc	mg/kg	83	52	51	40	73

Acid Extractable metals in soil						
Our Reference		205182-11	205182-15	205182-17	205182-18	205182-20
Your Reference	UNITS	SP3-8	SP4-5	SP5-4	DUP PB-1	SP1-3 - [TRIPLICATE]
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Date analysed	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	54	15	20	23	32
Copper	mg/kg	55	22	32	39	43
Lead	mg/kg	16	15	13	13	14
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	49	14	25	30	33
Zinc	mg/kg	90	42	59	60	69

Moisture						
Our Reference		205182-1	205182-5	205182-6	205182-8	205182-10
Your Reference	UNITS	SP1-3	SP2-5	SP3-3	SP3-5	SP3-7
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Date analysed	-	12/11/2018	12/11/2018	12/11/2018	12/11/2018	12/11/2018
Moisture	%	4.9	3.6	2.1	0.6	2.0

Moisture					
Our Reference		205182-11	205182-15	205182-17	205182-18
Your Reference	UNITS	SP3-8	SP4-5	SP5-4	DUP PB-1
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil
Date prepared	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Date analysed	-	12/11/2018	12/11/2018	12/11/2018	12/11/2018
Moisture	%	2.4	0.7	1.5	5.4

Asbestos ID - soils						
Our Reference		205182-1	205182-5	205182-6	205182-8	205182-10
Your Reference	UNITS	SP1-3	SP2-5	SP3-3	SP3-5	SP3-7
Date Sampled		06/11/2018	06/11/2018	06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	09/11/2018	09/11/2018	09/11/2018	09/11/2018	09/11/2018
Sample mass tested	g	Approx. 25g	Approx. 25g	Approx. 20g	Approx. 30g	Approx. 20g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils				
Our Reference		205182-11	205182-15	205182-17
Your Reference	UNITS	SP3-8	SP4-5	SP5-4
Date Sampled		06/11/2018	06/11/2018	06/11/2018
Type of sample		soil	soil	soil
Date analysed	-	09/11/2018	09/11/2018	09/11/2018
Sample mass tested	g	Approx. 20g	Approx. 25g	Approx. 20g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - materials		
Our Reference		205182-19
Your Reference	UNITS	F2
Date Sampled		06/11/2018
Type of sample		soil
Date analysed	-	09/11/2018
Mass / Dimension of Sample	-	152x140x20mm
Sample Description	-	Grey compressed fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative 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.
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-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 PQL is reflective of the lowest individual PQL 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 PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.

Method ID	Methodology Summary
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.
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. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	205182-5
Date extracted	-			09/11/2018	1	09/11/2018	09/11/2018		09/11/2018	09/11/2018
Date analysed	-			12/11/2018	1	12/11/2018	12/11/2018		12/11/2018	12/11/2018
TRH C_6 - C_9	mg/kg	25	Org-016	<25	1	<25	<25	0	115	96
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	1	<25	<25	0	115	96
Benzene	mg/kg	0.2	Org-016	<0.2	1	<0.2	<0.2	0	109	91
Toluene	mg/kg	0.5	Org-016	<0.5	1	<0.5	<0.5	0	112	93
Ethylbenzene	mg/kg	1	Org-016	<1	1	<1	<1	0	116	98
m+p-xylene	mg/kg	2	Org-016	<2	1	<2	<2	0	118	100
o-Xylene	mg/kg	1	Org-016	<1	1	<1	<1	0	118	100
naphthalene	mg/kg	1	Org-014	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	100	1	98	97	1	109	98

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	205182-5
Date extracted	-			09/11/2018	1	09/11/2018	09/11/2018		09/11/2018	09/11/2018
Date analysed	-			10/11/2018	1	10/11/2018	10/11/2018		10/11/2018	10/11/2018
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	1	<50	<50	0	90	105
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	1	<100	<100	0	85	103
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	1	<100	<100	0	93	105
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	1	<50	<50	0	90	105
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	1	<100	<100	0	85	103
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	1	<100	<100	0	93	105
Surrogate o-Terphenyl	%		Org-003	77	1	75	75	0	73	76

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	205182-5
Date extracted	-			09/11/2018	1	09/11/2018	09/11/2018		09/11/2018	09/11/2018
Date analysed	-			12/11/2018	1	12/11/2018	12/11/2018		12/11/2018	12/11/2018
Naphthalene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	104	104
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	107	105
Phenanthrene	mg/kg	0.1	Org-012	<0.1	1	0.1	<0.1	0	112	111
Anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	1	0.1	<0.1	0	103	105
Pyrene	mg/kg	0.1	Org-012	<0.1	1	0.1	<0.1	0	91	95
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	110	111
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	1	0.06	<0.05	18	107	109
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	89	1	90	91	1	87	87

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	205182-5
Date extracted	-			09/11/2018	1	09/11/2018	09/11/2018		09/11/2018	09/11/2018
Date analysed	-			09/11/2018	1	09/11/2018	09/11/2018		09/11/2018	09/11/2018
HCB	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	107	109
gamma-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	119	126
Heptachlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	106	110
delta-BHC	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	115	122
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	120	112
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	122	113
Dieldrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	119	112
Endrin	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	116	122
pp-DDD	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	114	135
Endosulfan II	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	97	90
Methoxychlor	mg/kg	0.1	Org-005	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	84	1	124	112	10	120	110

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	205182-5
Date extracted	-			09/11/2018	1	09/11/2018	09/11/2018		09/11/2018	09/11/2018
Date analysed	-			09/11/2018	1	09/11/2018	09/11/2018		09/11/2018	09/11/2018
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	120	89
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	106	97
Dimethoate	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	110	104
Fenitrothion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	101	98
Malathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	78	79
Parathion	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	104	97
Ronnel	mg/kg	0.1	Org-008	<0.1	1	<0.1	<0.1	0	126	86
Surrogate TCMX	%		Org-008	84	1	124	112	10	109	118

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	205182-5
Date extracted	-			09/11/2018	1	09/11/2018	09/11/2018		09/11/2018	09/11/2018
Date analysed	-			09/11/2018	1	09/11/2018	09/11/2018		09/11/2018	09/11/2018
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	115	96
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCLMX	%		Org-006	84	1	124	112	10	109	112

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	205182-5
Date prepared	-			09/11/2018	1	09/11/2018	09/11/2018		09/11/2018	09/11/2018
Date analysed	-			09/11/2018	1	09/11/2018	09/11/2018		09/11/2018	09/11/2018
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	106	88
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	99	88
Chromium	mg/kg	1	Metals-020	<1	1	49	29	51	103	164
Copper	mg/kg	1	Metals-020	<1	1	66	40	49	103	173
Lead	mg/kg	1	Metals-020	<1	1	16	14	13	101	101
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	113	115
Nickel	mg/kg	1	Metals-020	<1	1	42	36	15	97	123
Zinc	mg/kg	1	Metals-020	<1	1	83	71	16	99	122

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.

Report Comments

Asbestos: Excessive sample volumes were provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.
Note: Samples 205182-6,11 were sub-sampled from bags provided by the client.

Acid Extractable Metals in Soil - Spike recovery for Cr and Cu in sample #5 at 164% and 173% respectively which is outside lab acceptance criteria (70-130%), however, the LCS recovery is acceptable at 103% for both elements, sample heterogeneity suspected.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 205182-1 for Cr. Therefore a triplicate result has been issued as laboratory sample number 205182-20.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD 12 ASHLEY STREET CHATSWOOD NSW 2067 P: (02) 99106200 F: (02) 99106201 Attention: Aileen	EIS Job Number: E31675KR Date Results Required: ~~STANDARD~~ 3 days Page: 1	ENVIRONMENTAL INVESTIGATION SERVICES REAR OF 115 WICKS ROAD MACQUARIE PARK, NSW 2113 P: 02-9888 5000 F: 02-9888 5001 Attention: Priya Dass

Location: Penrith

Sampler:

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Depth (m)	Sample Container	PID	Sample Description	Combo 2	Combo 3a	Combo 6	Combo 6a	8 Metals	PAHs	TRH/BTEX	BTEX	Asbestos			
6/11/18	1	SP1-3		G, A	0.0	Fill				✓								
	2	SP1-4																
	3	SP2-3																
	4	SP2-4																
	5	SP2-5								✓								
	6	SP3-3								✓								
	7	SP3-4																
	8	SP3-5								✓								
	9	SP3-6																
	10	SP3-7								✓								
	11	SP3-8								✓								
	12	SP3-9																
	13	SP4-3																
	14	SP4-4																
	15	SP4-5								✓								
	16	SP5-3																
	17	SP5-4								✓								
	18	DUP PB-1		↓	—				✓									
	19	[redacted]F2		↓	—	Material									✓			

ENVIROLAB Environmental Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 205182

Date Received: 08/11/18
Time Received: 16:00
Received By: EWG
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Remarks (comments/detection limits required):

Sample Containers:
G - 250mg Glass Jar
A - Ziplock Asbestos Bag
P - Plastic Bag

Relinquished By: Priya Dass	Date: 8/11/18	Time: 16:00	Received By: Ellen WG ELS	Date: 081118

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Priya Dass

Sample Login Details

Your reference	E31675KR, Penrith
Envirolab Reference	205182
Date Sample Received	08/11/2018
Date Instructions Received	08/11/2018
Date Results Expected to be Reported	13/11/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	19 soil
Turnaround Time Requested	3 days
Temperature on Receipt (°C)	5.4
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: 8566507
Version: 1, Version Date: 08/02/2019

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	Organophosphorus Pesticides	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils	Asbestos ID - materials	On Hold
SP1-3	✓	✓	✓	✓	✓	✓	✓	✓		
SP1-4										✓
SP2-3										✓
SP2-4										✓
SP2-5	✓	✓	✓	✓	✓	✓	✓	✓		
SP3-3	✓	✓	✓	✓	✓	✓	✓	✓		
SP3-4										✓
SP3-5	✓	✓	✓	✓	✓	✓	✓	✓		
SP3-6										✓
SP3-7	✓	✓	✓	✓	✓	✓	✓	✓		
SP3-8	✓	✓	✓	✓	✓	✓	✓	✓		
SP3-9										✓
SP4-3										✓
SP4-4										✓
SP4-5	✓	✓	✓	✓	✓	✓	✓	✓		
SP5-3										✓
SP5-4	✓	✓	✓	✓	✓	✓	✓	✓		
DUP PB-1	✓	✓	✓	✓	✓	✓	✓			
F2									✓	

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: 8566507
Version: 1, Version Date: 08/02/2019

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
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CERTIFICATE OF ANALYSIS 205400

Client Details

Client	Environmental Investigation Services
Attention	Priya Dass
Address	PO Box 976, North Ryde BC, NSW, 1670

Sample Details

Your Reference	**E31675KR, Penrith**
Number of Samples	7 WATER
Date samples received	12/11/2018
Date completed instructions received	12/11/2018

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	16/11/2018
Date of Issue	16/11/2018

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Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Results Approved By
Jeremy Faircloth, Organics Supervisor
Leon Ow, Chemist
Nick Sarlamis, Inorganics Supervisor
Steven Luong, Senior Chemist

Authorised By

Jacinta Hurst, Laboratory Manager

VOCs in water					
Our Reference		205400-1	205400-2	205400-3	205400-4
Your Reference	UNITS	MW201	MW202	MW203	MW204
Date Sampled		12/11/2018	12/11/2018	12/11/2018	12/11/2018
Type of sample		WATER	WATER	WATER	WATER
Date extracted	-	15/11/2018	15/11/2018	15/11/2018	15/11/2018
Date analysed	-	16/11/2018	16/11/2018	16/11/2018	16/11/2018
Dichlorodifluoromethane	µg/L	<10	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1	<1
Chloroform	µg/L	<1	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1	<1
Benzene	µg/L	<1	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1
Bromoform	µg/L	<1	<1	<1	<1

VOCs in water					
Our Reference		205400-1	205400-2	205400-3	205400-4
Your Reference	UNITS	MW201	MW202	MW203	MW204
Date Sampled		12/11/2018	12/11/2018	12/11/2018	12/11/2018
Type of sample		WATER	WATER	WATER	WATER
m+p-xylene	µg/L	<2	<2	<2	<2
Styrene	µg/L	<1	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1	<1
o-xylene	µg/L	<1	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	103	104	104	101
Surrogate toluene-d8	%	95	97	97	97
Surrogate 4-BFB	%	98	98	97	98

vTRH(C6-C10)/BTEXN in Water						
Our Reference		205400-1	205400-2	205400-3	205400-4	205400-5
Your Reference	UNITS	MW201	MW202	MW203	MW204	TS
Date Sampled		12/11/2018	12/11/2018	12/11/2018	12/11/2018	12/11/2018
Type of sample		WATER	WATER	WATER	WATER	WATER
Date extracted	-	15/11/2018	15/11/2018	15/11/2018	15/11/2018	14/11/2018
Date analysed	-	16/11/2018	16/11/2018	16/11/2018	16/11/2018	15/11/2018
TRH C_6 - C_9	µg/L	<10	<10	<10	<10	[NA]
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10	[NA]
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10	[NA]
Benzene	µg/L	<1	<1	<1	<1	107%
Toluene	µg/L	<1	<1	<1	<1	104%
Ethylbenzene	µg/L	<1	<1	<1	<1	107%
m+p-xylene	µg/L	<2	<2	<2	<2	109%
o-xylene	µg/L	<1	<1	<1	<1	109%
Naphthalene	µg/L	<1	<1	<1	<1	[NA]
Surrogate Dibromofluoromethane	%	103	104	104	101	102
Surrogate toluene-d8	%	95	97	97	97	100
Surrogate 4-BFB	%	98	98	97	98	101

vTRH(C6-C10)/BTEXN in Water			
Our Reference		205400-6	205400-7
Your Reference	UNITS	DUP MP1	TB
Date Sampled		12/11/2018	12/11/2018
Type of sample		WATER	WATER
Date extracted	-	14/11/2018	14/11/2018
Date analysed	-	15/11/2018	15/11/2018
TRH C_6 - C_9	µg/L	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10
Benzene	µg/L	<1	<1
Toluene	µg/L	<1	<1
Ethylbenzene	µg/L	<1	<1
m+p-xylene	µg/L	<2	<2
o-xylene	µg/L	<1	<1
Naphthalene	µg/L	<1	<1
Surrogate Dibromofluoromethane	%	100	103
Surrogate toluene-d8	%	96	96
Surrogate 4-BFB	%	99	101

svTRH (C10-C40) in Water						
Our Reference		205400-1	205400-2	205400-3	205400-4	205400-6
Your Reference	UNITS	MW201	MW202	MW203	MW204	DUP MP1
Date Sampled		12/11/2018	12/11/2018	12/11/2018	12/11/2018	12/11/2018
Type of sample		WATER	WATER	WATER	WATER	WATER
Date extracted	-	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
Date analysed	-	15/11/2018	15/11/2018	15/11/2018	15/11/2018	15/11/2018
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100	<100
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100	<100
Surrogate o-Terphenyl	%	87	97	91	90	107

PAHs in Water - Low Level						
Our Reference		205400-1	205400-2	205400-3	205400-4	205400-6
Your Reference	UNITS	MW201	MW202	MW203	MW204	DUP MP1
Date Sampled		12/11/2018	12/11/2018	12/11/2018	12/11/2018	12/11/2018
Type of sample		WATER	WATER	WATER	WATER	WATER
Date extracted	-	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
Date analysed	-	15/11/2018	15/11/2018	15/11/2018	15/11/2018	15/11/2018
Naphthalene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE	NIL (+)VE
Surrogate p-Terphenyl-d14	%	82	89	87	89	92

HM in water - dissolved						
Our Reference		205400-1	205400-2	205400-3	205400-4	205400-6
Your Reference	UNITS	MW201	MW202	MW203	MW204	DUP MP1
Date Sampled		12/11/2018	12/11/2018	12/11/2018	12/11/2018	12/11/2018
Type of sample		WATER	WATER	WATER	WATER	WATER
Date prepared	-	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
Date analysed	-	14/11/2018	14/11/2018	14/11/2018	14/11/2018	14/11/2018
Arsenic-Dissolved	µg/L	<1	<1	<1	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1	<1
Copper-Dissolved	µg/L	<1	<1	<1	<1	<1
Lead-Dissolved	µg/L	<1	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	<1	<1	<1	<1	1
Zinc-Dissolved	µg/L	6	7	5	2	4

Miscellaneous Inorganics					
Our Reference	UNITS	205400-1	205400-2	205400-3	205400-4
Your Reference		MW201	MW202	MW203	MW204
Date Sampled		12/11/2018	12/11/2018	12/11/2018	12/11/2018
Type of sample		WATER	WATER	WATER	WATER
Date prepared	-	12/11/2018	12/11/2018	12/11/2018	12/11/2018
Date analysed	-	12/11/2018	12/11/2018	12/11/2018	12/11/2018
pH	pH Units	7.0	6.8	6.4	6.7
Electrical Conductivity	µS/cm	490	340	530	360
Ammonia as N in water	mg/L	<0.005	<0.005	0.15	<0.005

Method ID	Methodology Summary
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-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Inorg-057	Ammonia - determined colourimetrically, based on APHA latest edition 4500-NH3 F. Soils are analysed following a KCl extraction.
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	-			15/11/2018	[NT]	[NT]	[NT]	[NT]	15/11/2018	[NT]
Date analysed	-			16/11/2018	[NT]	[NT]	[NT]	[NT]	16/11/2018	[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]	100	[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]	97	[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]	112	[NT]
1,1,1-trichloroethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	103	[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]	109	[NT]
Bromodichloromethane	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	107	[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]	105	[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-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	101	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate toluene-d8	%		Org-013	97	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-BFB	%		Org-013	98	[NT]	[NT]	[NT]	[NT]	105	[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	-			15/11/2018	[NT]	[NT]	[NT]	[NT]	15/11/2018	[NT]
Date analysed	-			16/11/2018	[NT]	[NT]	[NT]	[NT]	16/11/2018	[NT]
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	113	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	113	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	116	[NT]
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	115	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	115	[NT]
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-016	101	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate toluene-d8	%		Org-016	97	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-BFB	%		Org-016	98	[NT]	[NT]	[NT]	[NT]	105	[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	-			14/11/2018	[NT]	[NT]	[NT]	[NT]	14/11/2018	[NT]
Date analysed	-			14/11/2018	[NT]	[NT]	[NT]	[NT]	14/11/2018	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	116	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	99	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	116	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	99	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
Surrogate o-Terphenyl	%		Org-003	92	[NT]	[NT]	[NT]	[NT]	106	[NT]

QUALITY CONTROL: PAHs in Water - Low Level					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			14/11/2018	[NT]	[NT]	[NT]	[NT]	14/11/2018	[NT]
Date analysed	-			15/11/2018	[NT]	[NT]	[NT]	[NT]	15/11/2018	[NT]
Naphthalene	µg/L	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	80	[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]	91	[NT]
Phenanthrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	93	[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]	97	[NT]
Pyrene	µg/L	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	88	[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]	96	[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]	93	[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	88	[NT]	[NT]	[NT]	[NT]	92	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			14/11/2018	[NT]	[NT]	[NT]	[NT]	14/11/2018	[NT]
Date analysed	-			14/11/2018	[NT]	[NT]	[NT]	[NT]	14/11/2018	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	[NT]	[NT]	[NT]	[NT]	90	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: Miscellaneous Inorganics					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			12/11/2018	[NT]	[NT]	[NT]	[NT]	12/11/2018	[NT]
Date analysed	-			12/11/2018	[NT]	[NT]	[NT]	[NT]	12/11/2018	[NT]
pH	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	102	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Ammonia as N in water	mg/L	0.005	Inorg-057	<0.005	[NT]	[NT]	[NT]	[NT]	100	[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.

SAMPLE AND CHAIN OF CUSTODY FORM

TO:		FROM:
ENVIROLAB SERVICES PTY LTD	EIS Job Number: E31675KR	ENVIRONMENTAL INVESTIGATION SERVICES
12 ASHLEY STREET		REAR OF 115 WICKS ROAD
CHATSWOOD NSW 2067		MACQUARIE PARK, NSW 2113
P: (02) 99106200	Date Results Required: 3 Days	P: 02-9888 5000 F: 02-9888 5001
F: (02) 99106201		Attention: Priya Dass
Attention: Aileen	Page: 1	

Location: Penrith

Sampler:

Sample Preserved in Esky on Ice

Tests Required

Date Sampled	Lab Ref:	Sample Number	Sample Containers	PID	Sample Description	Combo 2	Combo 3L	VOCs	pH / EC	8 Metals	PAHs	TRH/BTEX	BTEX	Hardness	Ammonia		
12/11/2018	1	MW201	G1, 2V, H, PVC				X	X	X						X		
	2	MW202					X	X	X						X		
	3	MW203					X	X	X						X		
	4	MW204					X	X	X						X		
	5	TS											X				
	6	Dup MP1					X										
	7	Extra TB.															

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

ENVIROLAB

Job No: 250254 00

Date Received: 12/11/18

Time Received: 16:00

Received By: MT

Temp: Cool/Ambient

Cooling: Ice/Icepack

Security: Intact/Broken/None

Remarks (comments/detection limits required):

All analysis PQLs to ANZECC (2000) Detection Limits Please

Sample Containers:
G1 - 500mL Amber Glass Bottle G2 - 1L Amber Glass Bottle
V - BTEX Vial H - HNO3 Wash PVC
PVC - HDPE Plastic Bottles

Relinquished By: Priya Dass	Date: 12/11/18	Time:	Received By: Ming Yan Zo	Date: 12/11/18 16:00

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Environmental Investigation Services
Attention	Priya Dass

Sample Login Details

Your reference	E31675KR, Penrith
Envirolab Reference	205400
Date Sample Received	12/11/2018
Date Instructions Received	12/11/2018
Date Results Expected to be Reported	16/11/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	7 WATER
Turnaround Time Requested	3 days
Temperature on Receipt (°C)	8.1
Cooling Method	Ice
Sampling Date Provided	YES

Comments

EXTRA TB RECEIVED

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: 8566507
Version: 1, Version Date: 08/02/2019

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

Sample ID	VOCs in water	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water - Low Level	HM in water - dissolved	pH	Electrical Conductivity	Ammonia as N in water
MW201	✓	✓	✓	✓	✓	✓	✓	✓
MW202	✓	✓	✓	✓	✓	✓	✓	✓
MW203	✓	✓	✓	✓	✓	✓	✓	✓
MW204	✓	✓	✓	✓	✓	✓	✓	✓
TS		✓						
DUP MP1		✓	✓	✓	✓			
TB		✓						

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: 8566507
Version: 1, Version Date: 08/02/2019

Borehole Logs

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No.
MW201
1/2

Environmental logs are not to be used for geotechnical purposes

Client: CADENCE PROPERTY GROUP PTY LTD

Project: PROPOSED WAREHOUSE

Location: 128 ANDREWS ROAD, PENRITH, NSW

Job No. E31675KR
Date: 05/11/2018

Method: SPIRAL AUGER/TUBEX JK500

Logged/Checked by: P.B./A.K.

R.L. Surface: N/A
Datum:

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
							0			FILL: Silt, low plasticity, brown, trace of root fibres.	w<PL			
									ML	SILT: low plasticity, orange brown, trace of fine to medium grained sand.	w<PL			
							1							
							2							
							3							
							4		GM	Sandy silty GRAVEL: fine to coarse grained, dark grey brown, with sandy silt, low plasticity, orange brown.	D			
							5							
							6							
12/11/18							7				M			

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No.
MW201
2/2

Environmental logs are not to be used for geotechnical purposes

Client: CADENCE PROPERTY GROUP PTY LTD

Project: PROPOSED WAREHOUSE

Location: 128 ANDREWS ROAD, PENRITH, NSW

Job No. E31675KR **Method:** SPIRAL AUGER/TUBEX JK500 **R.L. Surface:** N/A

Date: 05/11/2018 **Datum:**

Logged/Checked by: P.B./A.K.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
							8		GM	Sandy silty GRAVEL: fine to coarse grained, dark grey brown, with sandy silt, low plasticity, orange brown.	M			
							9			END OF BOREHOLE AT 9.0m				GROUNDWATER MOINTORING WELL INSTALLED TO 8.5m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2.5m TO 8.5m. CASING 0.0m TO 2.5m TO SURFACE. 2mm SAND FILTER PACK 5.5m TO 8. 5m. BENTONITE SEAL 5.0m TO 5. 5m. BACKFILLED TO THE SURFACE. COMPLETED 0.47m ABOVE GROUND
							10							
							11							
							12							
							13							
							14							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No.
MW202
1/2

Environmental logs are not to be used for geotechnical purposes

Client: CADENCE PROPERTY GROUP PTY LTD

Project: PROPOSED WAREHOUSE

Location: 128 ANDREWS ROAD, PENRITH, NSW

Job No. E31675KR **Method:** SPIRAL AUGER/TUBEX JK500 **R.L. Surface:** N/A

Date: 05/11/2018 **Datum:**

Logged/Checked by: P.B./A.K.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
							0			FILL: Silt, low plasticity, brown, trace of root fibres.	w<PL			
									ML	SILT: low plasticity, orange brown, trace of fine to medium grained sand.	w<PL			
							1							
							2							
							3							
							4		GM	Sandy silty GRAVEL: fine to coarse grained, dark grey brown, with sandy silt, low plasticity, orange brown.	D			
							5							
							6				M			
12/11/18							7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No.
MW202
2/2

Environmental logs are not to be used for geotechnical purposes

Client: CADENCE PROPERTY GROUP PTY LTD

Project: PROPOSED WAREHOUSE

Location: 128 ANDREWS ROAD, PENRITH, NSW

Job No. E31675KR
Date: 05/11/2018

Method: SPIRAL AUGER/TUBEX JK500

Logged/Checked by: P.B./A.K.

R.L. Surface: N/A
Datum:

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
							8		GM	Sandy silty GRAVEL: fine to coarse grained, dark grey brown, with sandy silt, low plasticity, orange brown.	M			
							9			END OF BOREHOLE AT 9.0m				GROUNDWATER MOINTORING WELL INSTALLED TO 8.5m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2.5m TO 8.5m. CASING 0.0m TO 2.5m TO SURFACE. 2mm SAND FILTER PACK 5.5m TO 8.5m. BENTONITE SEAL 5.0m TO 5.5m. BACKFILLED TO THE SURFACE. COMPLETED 0.61m ABOVE GROUND
							10							
							11							
							12							
							13							
							14							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No.
MW203
1/2

Environmental logs are not to be used for geotechnical purposes

Client: CADENCE PROPERTY GROUP PTY LTD

Project: PROPOSED WAREHOUSE

Location: 128 ANDREWS ROAD, PENRITH, NSW

Job No. E31675KR **Method:** SPIRAL AUGER/TUBEX JK500 **R.L. Surface:** N/A

Date: 06/11/2018 **Datum:**

Logged/Checked by: P.B./A.K.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
							0			FILL: Silt, low plasticity, brown, trace of root fibres.	w<PL			
									ML	SILT: low plasticity, orange brown, trace of fine to medium grained sand.	w<PL			
							1							
							2							
							3							
							4		GM	Sandy silty GRAVEL: fine to coarse grained, dark grey brown, with sandy silt, low plasticity, orange brown.	D			
							5							
							6							
12/11/18							7				M			

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No.
MW203
2/2

Environmental logs are not to be used for geotechnical purposes

Client: CADENCE PROPERTY GROUP PTY LTD

Project: PROPOSED WAREHOUSE

Location: 128 ANDREWS ROAD, PENRITH, NSW

Job No. E31675KR **Method:** SPIRAL AUGER/TUBEX JK500 **R.L. Surface:** N/A

Date: 06/11/2018 **Datum:**

Logged/Checked by: P.B./A.K.

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
									GM	Sandy silty GRAVEL: fine to coarse grained, dark grey brown, with sandy silt, low plasticity, orange brown.	M			
							8			END OF BOREHOLE AT 8.0m				GROUNDWATER MOINTORING WELL INSTALLED TO 8.0m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2.0m TO 8.0m. CASING 0.0m TO 2.0m TO SURFACE. 2mm SAND FILTER PACK 4.5m TO 8.0m. BENTONITE SEAL 4.0m TO 4.5m. BACKFILLED TO THE SURFACE. COMPLETED 1.08m ABOVE GROUND
							9							
							10							
							11							
							12							
							13							
							14							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No.
MW204
1/2

Environmental logs are not to be used for geotechnical purposes

Client: CADENCE PROPERTY GROUP PTY LTD

Project: PROPOSED WAREHOUSE

Location: 128 ANDREWS ROAD, PENRITH, NSW

Job No. E31675KR
Date: 06/11/2018

Method: SPIRAL AUGER/TUBEX JK500

Logged/Checked by: P.B./A.K.

R.L. Surface: N/A
Datum:

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
							0			FILL: Silt, low plasticity, brown, trace of root fibres.	w<PL			
									ML	SILT: low plasticity, orange brown, trace of fine to medium grained sand.	w<PL			
							1							
							2							
							3							
							4		GM	Sandy silty GRAVEL: fine to coarse grained, dark grey brown, with sandy silt, low plasticity, orange brown.	D			
							5							
▶							6				M			
▼ 12/11/18							7							

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

ENVIRONMENTAL LOG

Borehole No.
MW204
2/2

Environmental logs are not to be used for geotechnical purposes

Client: CADENCE PROPERTY GROUP PTY LTD

Project: PROPOSED WAREHOUSE

Location: 128 ANDREWS ROAD, PENRITH, NSW

Job No. E31675KR
Date: 06/11/2018
Method: SPIRAL AUGER/TUBEX JK500
Logged/Checked by: P.B./A.K.
R.L. Surface: N/A
Datum:

Groundwater Record	SAMPLES ES	SAMPLES ASS	SAMPLES ASB	SAMPLES SAL	SAMPLES DB	Field Tests	Depth (m)	Graphic Log	Unified Classification	DESCRIPTION	Moisture Condition/ Weathering	Strength/ Rel. Density	Hand Penetrometer Readings (kPa.)	Remarks
									GM	Sandy silty GRAVEL: fine to coarse grained, dark grey brown, with sandy silt, low plasticity, orange brown.	M			
							8			END OF BOREHOLE AT 8.0m				GROUNDWATER MOINTORING WELL INSTALLED TO 8.0m. CLASS 18 MACHINE SLOTTED 50mm DIA. PVC STANDPIPE 2.0m TO 8.0m. CASING 0.0m TO 2.0m TO SURFACE. 2mm SAND FILTER PACK 4.5m TO 8.0m. BENTONITE SEAL 4.0m TO 4.5m. BACKFILLED TO THE SURFACE. COMPLETED 1.08m ABOVE GROUND
							9							
							10							
							11							
							12							
							13							
							14							

ENVIRONMENTAL LOGS EXPLANATORY NOTES

INTRODUCTION

These notes have been provided to amplify the environmental report in regard to classification methods, field procedures and certain matters relating to the logging of soil and rock. Not all notes are necessarily relevant to all reports.

Where geotechnical borehole logs are utilised for environmental purpose, reference should also be made to the explanatory notes included in the geotechnical report. Environmental logs are not suitable for geotechnical purposes.

The ground is a product of continuing natural and man-made processes and therefore exhibits a variety of characteristics and properties which vary from place to place and can change with time. Environmental studies include gathering and assimilating limited facts about these characteristics and properties in order to understand or predict the behaviour of the ground on a particular site under certain conditions. This report may contain such facts obtained by inspection, excavation, probing, sampling, testing or other means of investigation. If so, they are directly relevant only to the ground at the place where and time when the investigation was carried out.

DESCRIPTION AND CLASSIFICATION METHODS

The methods of description and classification of soils and rocks used in this report are based on Australian Standard 1726:2017 *'Geotechnical Site Investigations'*. In general, descriptions cover the following properties – soil or rock type, colour, structure, strength or density, and inclusions. Identification and classification of soil and rock involves judgement and the Company infers accuracy only to the extent that is common in current geoenvironmental practice.

Soil types are described according to the predominating particle size and behaviour as set out in the attached soil classification table qualified by the grading of other particles present (eg. sandy clay) as set out below:

Soil Classification	Particle Size
Clay	< 0.002mm
Silt	0.002 to 0.075mm
Sand	0.075 to 2.36mm
Gravel	2.36 to 63mm
Cobbles	63 to 200mm
Boulders	> 200mm

Non-cohesive soils are classified on the basis of relative density, generally from the results of Standard Penetration Test (SPT) as below:

Relative Density	SPT 'N' Value (blows/300mm)
Very loose (VL)	< 4
Loose (L)	4 to 10
Medium dense (MD)	10 to 30
Dense (D)	30 to 50
Very Dense (VD)	> 50

Cohesive soils are classified on the basis of strength (consistency) either by use of a hand penetrometer, vane shear, laboratory testing and/or tactile engineering examination. The strength terms are defined as follows.

Classification	Unconfined Compressive Strength (kPa)	Indicative Undrained Shear Strength (kPa)
Very Soft (VS)	≤ 25	≤ 12
Soft (S)	> 25 and ≤ 50	> 12 and ≤ 25
Firm (F)	> 50 and ≤ 100	> 25 and ≤ 50
Stiff (St)	> 100 and ≤ 200	> 50 and ≤ 100
Very Stiff (VSt)	> 200 and ≤ 400	> 100 and ≤ 200
Hard (Hd)	> 400	> 200
Friable (Fr)	Strength not attainable – soil crumbles	

Rock types are classified by their geological names, together with descriptive terms regarding weathering, strength, defects, etc. Where relevant, further information regarding rock classification is given in the text of the report. In the Sydney Basin, 'shale' is used to describe fissile mudstone, with a weakness parallel to bedding. Rocks with alternating inter-laminations of different grain size (eg. siltstone/claystone and siltstone/fine grained sandstone) are referred to as 'laminite'.

INVESTIGATION METHODS

The following is a brief summary of investigation methods currently adopted by the Company and some comments on their use and application. All methods except test pits, hand auger drilling and portable Dynamic Cone Penetrometers require the use of a mechanical rig which is commonly mounted on a truck chassis or track base.

Test Pits: These are normally excavated with a backhoe or a tracked excavator, allowing close examination of the insitu soils and 'weaker' bedrock if it is safe to descend into the pit. The depth of penetration is limited to about 3m for a backhoe and up to 6m for a large excavator. Limitations of test pits are the problems associated with disturbance and difficulty of reinstatement and the consequent effects on close-by structures. Care must be taken if construction is to be carried out near test pit locations to either properly recompact the backfill during construction or to design and construct the structure so as not to be adversely affected by poorly compacted backfill at the test pit location.

Hand Auger Drilling: A borehole of 50mm to 100mm diameter is advanced by manually operated equipment. Refusal of the hand auger can occur on a variety of materials such as obstructions within any fill, tree roots, hard clay, gravel or ironstone, cobbles and boulders, and does not necessarily indicate rock level.

Continuous Spiral Flight Augers: The borehole is advanced using 75mm to 115mm diameter continuous spiral flight augers, which are withdrawn at intervals to allow sampling and insitu testing. This is a relatively economical means of drilling in clays and in sands above the water table. Samples are returned to the surface by the flights or may be collected after withdrawal of the auger flights, but they can be very disturbed and layers may become mixed. Information from the auger sampling (as distinct from specific sampling by SPTs or undisturbed samples) is of limited reliability due to mixing or softening of samples by groundwater, or uncertainties as to the original depth of the samples. Augering below the groundwater table is of even lesser reliability than augering above the water table.

Rock Augering: Use can be made of a Tungsten Carbide (TC) bit for auger drilling into rock to indicate rock quality and continuity by variation in drilling resistance and from examination of recovered rock cuttings. This method of investigation is quick and relatively inexpensive but provides only an indication of the likely rock strength and predicted values may be in error by a strength order. Where rock strengths may have a significant impact on construction feasibility or costs, then further investigation by means of cored boreholes may be warranted.

Wash Boring: The borehole is usually advanced by a rotary bit, with water being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be assessed from the cuttings, together with some information from "feel" and rate of penetration.

Mud Stabilised Drilling: Either Wash Boring or Continuous Core Drilling can use drilling mud as a circulating fluid to stabilise the borehole. The term 'mud' encompasses a range of products ranging from bentonite to polymers. The mud tends to mask the cuttings and reliable identification is only possible from intermittent intact sampling (eg. from SPT and U50 samples) or from rock coring, etc.

Continuous Core Drilling: A continuous core sample is obtained using a diamond tipped core barrel. Provided full core recovery is achieved (which is not always possible in very low strength rocks and granular soils), this technique provides a very reliable (but relatively expensive) method of investigation. In rocks, NMLC or HQ triple tube core barrels, which give a core of about 50mm and 61mm diameter, respectively, is usually used with water flush. The length of core recovered is compared to the length drilled and any length not recovered is shown as NO CORE. The location of NO CORE recovery is determined on site by the supervising engineer; where the location is uncertain, the loss is placed at the bottom of the drill run.

Standard Penetration Tests: Standard Penetration Tests (SPT) are used mainly in non-cohesive soils, but can also be used in cohesive soils, as a means of indicating density or strength and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289.6.3.1–2004 (R2016) *'Methods of Testing Soils for Engineering Purposes, Soil Strength and Consolidation Tests – Determination of the Penetration Resistance of a Soil – Standard Penetration Test (SPT)'*.

The test is carried out in a borehole by driving a 50mm diameter split sample tube with a tapered shoe, under the impact of a 63.5kg hammer with a free fall of 760mm. It is normal for the tube to be driven in three successive 150mm increments and the 'N' value is taken as the number of blows for the last 300mm. In dense sands, very hard clays or weak rock, the full 450mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form:

- In the case where full penetration is obtained with successive blow counts for each 150mm of, say, 4, 6 and 7 blows, as

  N = 13
  4, 6, 7

- In a case where the test is discontinued short of full penetration, say after 15 blows for the first 150mm and 30 blows for the next 40mm, as

  N > 30
  15, 30/40mm

The results of the test can be related empirically to the engineering properties of the soil.

A modification to the SPT is where the same driving system is used with a solid 60° tipped steel cone of the same diameter as the SPT hollow sampler. The solid cone can be continuously driven for some distance in soft clays or loose sands, or may be used where damage would otherwise occur to the SPT. The results of this Solid Cone Penetration Test (SCPT) are shown as 'N_c' on the borehole logs, together with the number of blows per 150mm penetration.

LOGS

The borehole or test pit logs presented herein are an interpretation of the subsurface conditions, and their reliability will depend to some extent on the frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will enable the most reliable assessment, but is not always practicable or possible to justify on economic grounds. In any case, the boreholes or test pits represent only a very small sample of the total subsurface conditions.

The terms and symbols used in preparation of the logs are defined in the following pages.

Interpretation of the information shown on the logs, and its application to design and construction, should therefore take into account the spacing of boreholes or test pits, the method of drilling or excavation, the frequency of sampling and testing and the possibility of other than 'straight line' variations between the boreholes or test pits. Subsurface conditions between boreholes or test pits may vary significantly from conditions encountered at the borehole or test pit locations.

GROUNDWATER

Where groundwater levels are measured in boreholes, there are several potential problems:

- Although groundwater may be present, in low permeability soils it may enter the hole slowly or perhaps not at all during the time it is left open.
- A localised perched water table may lead to an erroneous indication of the true water table.
- Water table levels will vary from time to time with seasons or recent weather changes and may not be the same at the time of construction.
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must be washed out of the hole or 'reverted' chemically if reliable water observations are to be made.

More reliable measurements can be made by installing standpipes which are read after the groundwater level has stabilised at intervals ranging from several days to perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from perched water tables or surface water.

FILL

The presence of fill materials can often be determined only by the inclusion of foreign objects (eg. bricks, steel, etc) or by distinctly unusual colour, texture or fabric. Identification of the extent of fill materials will also depend on investigation methods and frequency. Where natural soils similar to those at the site are used for fill, it may be difficult with limited testing and sampling to reliably assess the extent of the fill.

The presence of fill materials is usually regarded with caution as the possible variation in density and material type is much greater than with natural soil deposits. Consequently, there is an increased risk of adverse environmental characteristics or behaviour. If the volume and nature of fill is of importance to a project, then frequent test pit excavations are preferable to boreholes.

LABORATORY TESTING

Laboratory testing has not been undertaken to confirm the soil classification and rock strengths indicated on the environmental logs unless noted in the report.

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SYMBOL LEGENDS

SOIL


FILL


TOPSOIL


CLAY (CL, CI, CH)


SILT (ML, MH)


SAND (SP, SW)


GRAVEL (GP, GW)


SANDY CLAY (CL, CI, CH)


SILTY CLAY (CL, CI, CH)


CLAYEY SAND (SC)


SILTY SAND (SM)


GRAVELLY CLAY (CL, CI, CH)


CLAYEY GRAVEL (GC)


SANDY SILT (ML, MH)


PEAT AND HIGHLY ORGANIC SOILS (Pt)

ROCK


CONGLOMERATE


SANDSTONE


SHALE/MUDSTONE


SILTSTONE


CLAYSTONE


COAL


LAMINITE


LIMESTONE


PHYLLITE, SCHIST


TUFF


GRANITE, GABBRO


DOLERITE, DIORITE


BASALT, ANDESITE


QUARTZITE

OTHER MATERIALS


BRICKS OR PAVERS


CONCRETE


ASPHALTIC CONCRETE

CLASSIFICATION OF COARSE AND FINE GRAINED SOILS

Major Divisions		Group Symbol	Typical Names	Field Classification of Sand and Gravel	Laboratory Classification	
Coarse grained soil (more than 65% of soil excluding oversize fraction is greater than 0.075mm)	GRAVEL (more than half of coarse fraction is larger than 2.36mm	GW	Gravel and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 4$ $1 < C_c < 3$
		GP	Gravel and gravel-sand mixtures, little or no fines, uniform gravels	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		GM	Gravel-silt mixtures and gravel-sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	Fines behave as silt
		GC	Gravel-clay mixtures and gravel-sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	Fines behave as clay
	SAND (more than half of coarse fraction is smaller than 2.36mm)	SW	Sand and gravel-sand mixtures, little or no fines	Wide range in grain size and substantial amounts of all intermediate sizes, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	$C_u > 6$ $1 < C_c < 3$
		SP	Sand and gravel-sand mixtures, little or no fines	Predominantly one size or range of sizes with some intermediate sizes missing, not enough fines to bind coarse grains, no dry strength	≤ 5% fines	Fails to comply with above
		SM	Sand-silt mixtures	'Dirty' materials with excess of non-plastic fines, zero to medium dry strength	≥ 12% fines, fines are silty	N/A
		SC	Sand-clay mixtures	'Dirty' materials with excess of plastic fines, medium to high dry strength	≥ 12% fines, fines are clayey	

Major Divisions		Group Symbol	Typical Names	Field Classification of Silt and Clay			Laboratory Classification
				Dry Strength	Dilatancy	Toughness	% < 0.075mm
ine grained soils (more than 35% of soil excluding oversize fraction is less than 0.075mm)	SILT and CLAY (low to medium plasticity)	ML	Inorganic silt and very fine sand, rock flour, silty or clayey fine sand or silt with low plasticity	None to low	Slow to rapid	Low	Below A line
		CL, CI	Inorganic clay of low to medium plasticity, gravelly clay, sandy clay	Medium to high	None to slow	Medium	Above A line
		OL	Organic silt	Low to medium	Slow	Low	Below A line
	SILT and CLAY (high plasticity)	MH	Inorganic silt	Low to medium	None to slow	Low to medium	Below A line
		CH	Inorganic clay of high plasticity	High to very high	None	High	Above A line
		OH	Organic clay of medium to high plasticity, organic silt	Medium to high	None to very slow	Low to medium	Below A line
	Highly organic soil	Pt	Peat, highly organic soil	–	–	–	–

Laboratory Classification Criteria

A well graded coarse grained soil is one for which the coefficient of uniformity $Cu > 4$ and the coefficient of curvature $1 < C_c < 3$. Otherwise, the soil is poorly graded. These coefficients are given by:

$$C_u = \frac{D_{60}}{D_{10}} \quad \text{and} \quad C_c = \frac{(D_{30})^2}{D_{10}\ D_{60}}$$

Where D_{10}, D_{30} and D_{60} are those grain sizes for which 10%, 30% and 60% of the soil grains, respectively, are smaller.

NOTES:

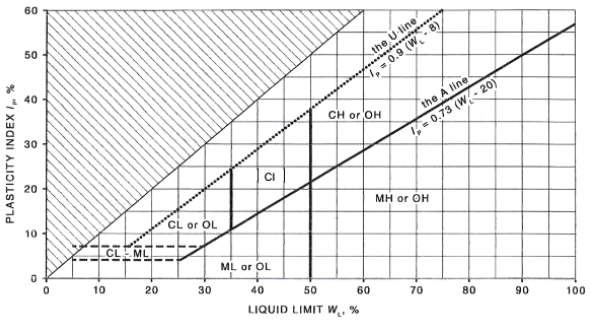
1 For a coarse grained soil with a fines content between 5% and 12%, the soil is given a dual classification comprising the two group symbols separated by a dash; for example, for a poorly graded gravel with between 5% and 12% silt fines, the classification is GP-GM.

2 Where the grading is determined from laboratory tests, it is defined by coefficients of curvature (C_c) and uniformity (C_u) derived from the particle size distribution curve.

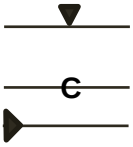
3 Clay soils with liquid limits > 35% and ≤ 50% may be classified as being of medium plasticity.

4 The U line on the Modified Casagrande Chart is an approximate upper bound for most natural soils.

Modified Casagrande Chart for Classifying Silts and Clays according to their Behaviour



LOG SYMBOLS

Log Column	Symbol	Definition
Groundwater Record		Standing water level. Time delay following completion of drilling/excavation may be shown. Extent of borehole/test pit collapse shortly after drilling/excavation. Groundwater seepage into borehole or test pit noted during drilling or excavation.
Samples	ES U50 DB DS ASB ASS SAL	Sample taken over depth indicated, for environmental analysis. Undisturbed 50mm diameter tube sample taken over depth indicated. Bulk disturbed sample taken over depth indicated. Small disturbed bag sample taken over depth indicated. Soil sample taken over depth indicated, for asbestos analysis. Soil sample taken over depth indicated, for acid sulfate soil analysis. Soil sample taken over depth indicated, for salinity analysis.
Field Tests	N = 17 4, 7, 10	Standard Penetration Test (SPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration. 'Refusal' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	N_c = 5 7 3R	Solid Cone Penetration Test (SCPT) performed between depths indicated by lines. Individual figures show blows per 150mm penetration for 60° solid cone driven by SPT hammer. 'R' refers to apparent hammer refusal within the corresponding 150mm depth increment.
	VNS = 25 PID = 100	Vane shear reading in kPa of undrained shear strength. Photoionisation detector reading in ppm (soil sample headspace test).
Moisture Condition (Fine Grained Soils)	w > PL $w \approx$ PL w < PL $w \approx$ LL w > LL	Moisture content estimated to be greater than plastic limit. Moisture content estimated to be approximately equal to plastic limit. Moisture content estimated to be less than plastic limit. Moisture content estimated to be near liquid limit. Moisture content estimated to be wet of liquid limit.
(Coarse Grained Soils)	D M W	DRY – runs freely through fingers. MOIST – does not run freely but no free water visible on soil surface. WET – free water visible on soil surface.
Strength (Consistency) Cohesive Soils	VS S F St VSt Hd Fr ( )	VERY SOFT – unconfined compressive strength ≤ 25kPa. SOFT – unconfined compressive strength > 25kPa and ≤ 50kPa. FIRM – unconfined compressive strength > 50kPa and ≤ 100kPa. STIFF – unconfined compressive strength > 100kPa and ≤ 200kPa. VERY STIFF – unconfined compressive strength > 200kPa and ≤ 400kPa. HARD – unconfined compressive strength > 400kPa. FRIABLE – strength not attainable, soil crumbles. Bracketed symbol indicates estimated consistency based on tactile examination or other assessment.
Density Index/ Relative Density (Cohesionless Soils)	VL L MD D VD ( )	**Density Index (I_D) Range (%)** / **SPT 'N' Value Range (Blows/300mm)** VERY LOOSE ≤ 15 — 0 – 4 LOOSE > 15 and ≤ 35 — 4 – 10 MEDIUM DENSE > 35 and ≤ 65 — 10 – 30 DENSE > 65 and ≤ 85 — 30 – 50 VERY DENSE > 85 — > 50 Bracketed symbol indicates estimated density based on ease of drilling or other assessment.
Hand Penetrometer Readings	300 250	Measures reading in kPa of unconfined compressive strength. Numbers indicate individual test results on representative undisturbed material unless noted otherwise.

Log Column	Symbol	Definition
Remarks	'V' bit	Hardened steel 'V' shaped bit.
	'TC' bit	Twin pronged tungsten carbide bit.
	T_{60}	Penetration of auger string in mm under static load of rig applied by drill head hydraulics without rotation of augers.
	Soil Origin	The geological origin of the soil can generally be described as:
		RESIDUAL – soil formed directly from insitu weathering of the underlying rock. No visible structure or fabric of the parent rock.
		EXTREMELY WEATHERED – soil formed directly from insitu weathering of the underlying rock. Material is of soil strength but retains the structure and/or fabric of the parent rock.
		ALLUVIAL – soil deposited by creeks and rivers.
		ESTUARINE – soil deposited in coastal estuaries, including sediments caused by inflowing creeks and rivers, and tidal currents.
		MARINE – soil deposited in a marine environment.
		AEOLIAN – soil carried and deposited by wind.
		COLLUVIAL – soil and rock debris transported downslope by gravity, with or without the assistance of flowing water. Colluvium is usually a thick deposit formed from a landslide. The description 'slopewash' is used for thinner surficial deposits.
		LITTORAL – beach deposited soil.

Classification of Material Weathering

Term		Abbreviation		Definition
Residual Soil		RS		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely Weathered		XW		Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.
Highly Weathered	Distinctly Weathered (Note 1)	HW	DW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately Weathered		MW		The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly Weathered		SW		Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh		FR		Rock shows no sign of decomposition of individual minerals or colour changes.

NOTE 1: The term 'Distinctly Weathered' is used where it is not practicable to distinguish between 'Highly Weathered' and 'Moderately Weathered' rock. 'Distinctly Weathered' is defined as follows: *'Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores'*. There is some change in rock strength.

Rock Material Strength Classification

Term	Abbreviation	Uniaxial Compressive Strength (MPa)	Guide to Strength	
			Point Load Strength Index $Is_{(50)}$ (MPa)	Field Assessment
Very Low Strength	VL	0.6 to 2	0.03 to 0.1	Material crumbles under firm blows with sharp end of pick; can be peeled with knife; too hard to cut a triaxial sample by hand. Pieces up to 30mm thick can be broken by finger pressure.
Low Strength	L	2 to 6	0.1 to 0.3	Easily scored with a knife; indentations 1mm to 3mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150mm long by 50mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.
Medium Strength	M	6 to 20	0.3 to 1	Scored with a knife; a piece of core 150mm long by 50mm diameter can be broken by hand with difficulty.
High Strength	H	20 to 60	1 to 3	A piece of core 150mm long by 50mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.
Very High Strength	VH	60 to 200	3 to 10	Hand specimen breaks with pick after more than one blow; rock rings under hammer.
Extremely High Strength	EH	> 200	> 10	Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.

Field Documents

JOB NO: E31675KR
LOCATION: Penrith

FIELD CALIBRATION FORM

PID

Make: MiniRAE	Model: 2000	Unit: RAE7350	Date of last factory calibration: 19/5/18
Date of calibration:		Name of Calibrator:	
Calibration gas: Iso-butylene		Calibration Gas Concentration:	100.0 ppm
Measured reading: 100 ppm		Error in measured reading: ± 0 ppm	
Measured reading Acceptable (Yes/No):			

DISSOLVED OXYGEN

Make:	Model: Aqua DY
Date of calibration:	Name of Calibrator: MMP
Span value: 70% to 130%%	
Measured value: 101	
Measured reading Acceptable (Yes/No):	

pH METER

Make: Orion	Model: Four star	
Date of calibration: 12/11/18	Name of Calibrator: MMP	
Buffer 1: Theoretical pH = 7.01± 0.01	Expiry date:	Lot No:
Buffer 2: Theoretical pH = 4.01± 0.01	Expiry date: 08/19	Lot No: 312725
Measured reading of Buffer 1: 7.09		
Measured reading of Buffer 2: 4.14		
Slope:	Measured reading Acceptable (Yes/No):	

CONDUCTIVITY METER

Make: Orion		Model: Four star	
Date: 12/11/18	Name of Calibrator: MMP		Temperature: 18.7 °C
Calibration solution: 1413 µs/cm @25°C		Expiry date: 06/19	Lot No: 313391
Theoretical conductivity at temperature (see solution container): 1261 µS/cm			
Measured conductivity: 1289 µS/cm		Measured reading Acceptable (Yes/No):	

REDOX METER

Make: Orion	Model: Four star	
Date of calibration: 12/11/18	Name of Calibrator: MMP	
Calibration solution: 240 mV	Expiry date: 01/23	Lot No: 1422
Theoretical redox value: 240mV		
Measured redox reading: 237 mV	Measured reading Acceptable (Yes/No):	

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

Client:	Cadence Property Group Pty Ltd	**Job No.:**	E31675KR
Project:	Proposed Warehouse	**Well No.:**	MW 201
Location:	128 ANDREWS ROAD, PENRITH, NSW	**Depth (m):**	8.5

WELL FINISH DETAILS

	Gatic Cover ☐	Standpipe ☑ 0.5 m	Other (describe) ☐

WELL DEVELOPMENT DETAILS

Method:	Bailer	**SWL – Before (m):**	7.025	- 0.47 = 6.55
Date:	5/11/2018	**Time – Before:**	5/11/2018	~3pm
Undertaken By:	PB	**SWL – After (m):**	6.755	- 0.47 = 6.28
Total Vol. Removed:	5 (dry)	**Time – After:**	6/11/2018	~5pm
PID Reading (ppm):	0			

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/m)	pH	Eh (mV)

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

No hydrocarbon odours or sheen.

Tested By:	PB
Date Tested:	5/11/2018
Checked By:	PD
Date:	8/11/18

Remarks:

- All measurements are corrected to ground level
- All stated Volumes are in Litres
- SWL is an abbreviation for standing water level
- Steady state conditions - difference in the pH less than 0.2 units and difference in conductivity less than 10%
- Minimum 3 monitoring well volumes are purged

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

Client:	Cadence Property Group Pty Ltd	**Job No.:**	E31675KR
Project:	Proposed Warehouse	**Well No.:**	MW202
Location:	128 ANDREWS ROAD, PENRITH, NSW	**Depth (m):**	8.5

WELL FINISH DETAILS

	Gatic Cover ☐	**Standpipe** ☑ 0.5m	**Other (describe)** ☐

WELL DEVELOPMENT DETAILS

Method:	Bailer	**SWL – Before (m):**	7.010 - 0.61 = 6.4
Date:	5/11/2018	**Time – Before:**	5/11/18 ~~3~~ 2pm
Undertaken By:	PB	**SWL – After (m):**	6.705 - 0.61 = 6.09
Total Vol. Removed:	4 (dry)	**Time – After:**	6/11/18 ~~5~~ 2pm
PID Reading (ppm):	0		

PB

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/m)	pH	Eh (mV)

Comments:Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

No hydrocarbon odours or sheen.

Tested By:	PB
Date Tested:	5/11/2018
Checked By:	PD
Date:	8/11/18

Remarks:

- All measurements are corrected to ground level
- All stated Volumes are in Litres
- SWL is an abbreviation for standing water level
- Steady state conditions - difference in the pH less than 0.2 units and difference in conductivity less than 10%
- Minimum 3 monitoring well volumes are purged

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

Client:	Cadence Property Group Pty Ltd	**Job No.:**	E31675KR
Project:	Proposed Warehouse	**Well No.:**	MW203
Location:	128 ANDREWS ROAD, PENRITH, NSW	**Depth (m):**	8.0

WELL FINISH DETAILS

	Gatic Cover ☐	**Standpipe** ☑ 1.0 m	**Other (describe)** ☐

WELL DEVELOPMENT DETAILS

Method:	Bailed	**SWL – Before (m):**	7.026 (50ppm) -1.08 = 5.94
Date:	6/11/2018	**Time – Before:**	6/11/2018
Undertaken By:	PB	**SWL – After (m):**	Dry
Total Vol. Removed:	5 (Dry)	**Time – After:**	6/11/2018 (<50ppm) ABV
PID Reading (ppm):	0		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/m)	pH	Eh (mV)

Comments:Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

No hydrocarbon odours or sheen

Tested By:	PB
Date Tested:	6/11/2018
Checked By:	PD
Date:	8/11/18

Remarks:

- All measurements are corrected to ground level
- All stated Volumes are in Litres
- SWL is an abbreviation for standing water level
- Steady state conditions - difference in the pH less than 0.2 units and difference in conductivity less than 10%
- Minimum 3 monitoring well volumes are purged

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

Client:	Cadence Property Group Pty Ltd	**Job No.:**	E31675KR
Project:	Proposed Warehouse	**Well No.:**	MW204
Location:	128 ANDREWS ROAD, PENRITH, NSW	**Depth (m):**	6.0

WELL FINISH DETAILS

	Gatic Cover ☐	**Standpipe** ☑	1.0 m	**Other (describe)** ☐	

WELL DEVELOPMENT DETAILS

Method:	Bailer	**SWL – Before (m):**	7.020 - 1.08 = 5.94
Date:	6/11/2018	**Time – Before:**	6/11/18
Undertaken By:	PB	**SWL – After (m):**	7.345 (5:15pm) - 1.08 = 6.26
Total Vol. Removed:	20 L	**Time – After:**	6/11/18
PID Reading (ppm):	0		

Comments:

DEVELOPMENT MEASUREMENTS

Volume Removed (L)	Temp (°C)	DO (mg/L)	EC (µS/m)	pH	Eh (mV)

Comments:Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Quick recharge well.
No hydrocarbon odours or sheen.

Tested By:	PB
Date Tested:	6/11/2018
Checked By:	PD
Date:	8/11/18

Remarks:

- All measurements are corrected to ground level
- All stated Volumes are in Litres
- SWL is an abbreviation for standing water level
- Steady state conditions - difference in the pH less than 0.2 units and difference in conductivity less than 10%
- Minimum 3 monitoring well volumes are purged

ENVIRONMENTAL INVESTIGATION SERVICES
CONSULTING ENVIRONMENTAL ENGINEERS

EIS

Client:	Cadence Property Group Pty Ltd	Job No.:	E31675KR
Project:	Proposed Warehouse	Well No.:	MW201
Location:	128 ANDREWS ROAD, PENRITH, NSW	Depth (m):	10.35

WELL FINISH

	Gatic Cover	✓	Standpipe		Other (describe)

WELL PURGE DETAILS: SUBTRACT HEIGHT OF STANDPIPE

Method:	R	SWL – Before:	7.1 - 0.47 = 6.63 ABK
Date:	12/11/18	Time – Before:	13:20
Undertaken By:	MMP	Total Vol Removed:	
Pump Program No:		PID (ppm):	3.0

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
Pump	unable	to	pull from 7-	10m	deep.			

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: 1 x glass amber, 4 x BTEX vials, 1 x H2NO3 plastic, 1 x H2SO4 plastic, 1 x unpreserved plastic

Stand pipe 470 above ground.

Tested By: Priya Dass MMP		**Remarks:**
Date Tested:	12/11/18	- All measurements are corrected to ground level
Checked By:	PD	- SWL is an abbreviation for standing water level
Date:	12/11/18	- Steady state conditions - difference in the pH less than 0.2 units and difference in conductivity less than 10%

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

Client:	Cadence Property Group Pty Ltd	**Job No.:**	E31675KR
Project:	Proposed Warehouse	**Well No.:**	MW202
Location:	128 ANDREWS ROAD, PENRITH, NSW	**Depth (m):**	8.25

WELL FINISH

	Gatic Cover	x	**Standpipe**		**Other (describe)**

WELL PURGE DETAILS: SUBTRACT HEIGHT

Method:	Peristaltic Pump	**SWL – Before:**	6.8 - 0.61 = 6.19
Date:	12/11/18	**Time – Before:**	12.05
Undertaken By:	MMP	**Total Vol Removed:**	4L
Pump Program No:		**PID (ppm):**	0.6

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
12:15	7.19	1		19.9	1.3	276.0	7.07	-71.9
12:17	7.39	2		19.0	0.6	273.0	6.956	-118.0
12:19	7.66	3		18.6	0.6	263.6	6.90	-72.1
12:25	7.67	4		18.9	0.6	267.4	6.91	-70.1

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: x glass amber, 4 x BTEX vials, x H2NO3 plastic, x H2SO4 plastic, x unpreserved plastic

stand pipe from datum ground surface

Tested By: Priya Dass	PD
Date Tested:	12/11/18
Checked By:	PD
Date:	12/11/18

Remarks:

- All measurements are corrected to ground level
- SWL is an abbreviation for standing water level
- Steady state conditions - difference in the pH less than 0.2 units and difference in conductivity less than 10%

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

Client:	Cadence Property Group Pty Ltd	**Job No.:**	E31675KR
Project:	Proposed Warehouse	**Well No.:**	MW203
Location:	128 ANDREWS ROAD, PENRITH, NSW	**Depth (m):**	10.2

WELL FINISH

	Gatic Cover	x	**Standpipe**		**Other (describe)**

WELL PURGE DETAILS: SUBTRACT HEIGHT

Method:	Peristaltic Pump	**SWL – Before:**	7.47 - 1.08 = 6.39
Date:	12/11/18	**Time – Before:**	11:05
Undertaken By:	MMP	**Total Vol Removed:**	
Pump Program No:		**PID (ppm):**	0.2

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
11:15	7.50	1		21.2	1.2	540	6.55	83.7
Pump unable to flow								

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: (x glass amber, 4 x BTEX vials, \ x H2NO3 plastic, \ x H2SO4 plastic, \ x unpreserved plastic

Stand up 1080 mm above ground surface

Tested By: Priya Dass PD	**Remarks:**
Date Tested: 12/11/18	- All measurements are corrected to ground level
Checked By: PD	- SWL is an abbreviation for standing water level
Date: 12/11/18	- Steady state conditions - difference in the pH less than 0.2 units and difference in conductivity less than 10%

ENVIRONMENTAL INVESTIGATION SERVICES

CONSULTING ENVIRONMENTAL ENGINEERS

EIS

Client:	Cadence Property Group Pty Ltd	**Job No.:**	E31675KR
Project:	Proposed Warehouse	**Well No.:**	MW204
Location:	128 ANDREWS ROAD, PENRITH, NSW	**Depth (m):**	9.15m

WELL FINISH

	Gatic Cover	X	**Standpipe**		**Other (describe)**

WELL PURGE DETAILS: SUBTRACT HEIGHT

Method:	Peristaltic pump	**SWL – Before:**	7.7m - 1.08 = 6.62
Date:	12/11/18	**Time – Before:**	0935
Undertaken By:	MNP	**Total Vol Removed:**	8L
Pump Program No:		**PID (ppm):**	0.4

PURGING / SAMPLING MEASUREMENTS

Time (min)	SWL (m)	Vol (L)	Notes	Temp (°C)	DO (mg/L)	EC (µS/cm)	pH	Eh (mV)
0930	7.7	1		19.9	3.2	430.6	7.81	193
0945	7.72	2		19.6	2.3	384.1	7.14	194.7
0950	7.73	3		19.6	2.0	338.5	7.08	191.8
0955	7.73	4		19.5	1.9	380.4	6.90	164.4
0959	7.73	5		19.5	2.0	325.0	6.93	141.1
1005	7.73	6		19.5	2.1	319.1	6.79	104.1
1011	7.74	7		19.6	2.2	315.7	6.74	69.1
1014	7.73	8		19.6	2.4	325.3	6.75	15.7

Comments: Odours (YES / NO), NAPL/PSH (YES / NO), Sheen (YES / NO), Steady State Achieved (YES / NO)

Sampling Containers Used: 1 x glass amber, 4 x BTEX vials, 1 x H2NO3 plastic, 1 x H2SO4 plastic, 1 x unpreserved plastic

Standpipe 1080mm above ground surface

DUPMP1

Tested By: Priya Dass MNP	**Remarks:**
Date Tested: 12/11/18	- All measurements are corrected to ground level
Checked By: PD	- SWL is an abbreviation for standing water level
Date: 12/11/18	- Steady state conditions - difference in the pH less than 0.2 units and difference in conductivity less than 10%