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Report on
Detailed Site Investigation for Contamination

Nepean Creative and Performing Arts High School
- Multi-Purpose Hall
115 - 119 Great Western Highway, Emu Plains, NSW

Prepared for
School Infrastructure NSW

Project 92407.02
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Executive Summary

Douglas Partners Pty Ltd (DP) was commissioned by School Infrastructure NSW (SINSW) to complete this Detail Site Investigation for Contamination (DSI) of the area proposed for construction of a multipurpose hall at nepean creative and performing arts high school - multi-purpose hall located at 115 - 119 Great Western Highway, Emu Plains, NSW (hereinafter referred to as 'the site').

In May 2020 DP completed a Preliminary Site Investigation for contamination (PSI) (Project 92407.00.R.002.Rev0) of the site. The results of the PSI identified the following potential areas of environmental concern (PAEC) which required further investigation for the site to be considered suitable for the proposed development:

- PAEC1 - Areas where actual or potential filling has occurred, including a raised area of fill in the western portion of the site.
- PAEC2 - A former building historically located in the northern portion of the site and nearby buildings contained asbestos.
- PAEC3 - Potential for contamination of surface soils in the vicinity of the shed within central portion of the site and the LPG ASTs to the north of the shed as the result of fuel/chemical spillages/leakages and storage malpractice.
- PAEC4 - Historical turf farming and/or market gardening activities. Potential impact to shallow soils across the site.

This DSI is required to further investigate the above AEC to support the proposed development works and to determine potential remediation requirements for the site, if any.

Initial soil sampling was undertaken during this DSI at 13 locations on an approximate 19 m grid across the site to investigate the potential for shallow soil and/or fill contamination associated with the above mentioned PAEC. Laboratory analysis of one soil sample collected from shallow fill at testpit BH12 completed in the carpark area in the north eastern portion of the site identified chrysotile asbestos within a fragment of fibre cement material within the fill sample.

Other COPC were not detected in samples collected during the initial sampling at concentrations that would present a human health or ecological risk for the proposed development.

Additional testpit sampling at 12 locations completed within the carpark area and another three within the proposed building footprint did not identify further fragments or asbestos in soils therefore the ACM fragment identified at BH12 is considered likely to be an anomalous/isolated occurrence (since removed) and not indicative of widespread impact.

From a contamination perspective, based on the findings of this DSI and previous PSI, it is concluded that no further investigations or remediation works are warranted for the site.

Notwithstanding the above a potential still exists for isolated occurrences of ACM to be encountered during any future soil disturbance given the following:

- The limitations associated with grid-based sampling and the potential for undetected variations of fill to exist between sampling locations; and
- The identification of the aforementioned fragment of ACM.

It is therefore recommended that an Unexpected Finds Protocol be prepared and implemented to provide a formal contingency to be followed in the event of an unexpected find with respect to potential site contamination issues encountered during any bulk earthworks.

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115-119 Great Western Highway, Emu Plains, NSW

1. Introduction

Douglas Partners Pty Ltd (DP) was commissioned by School Infrastructure NSW (SINSW) to complete this Detail Site Investigation for Contamination (DSI) of the area proposed for construction of a multipurpose hall at nepean creative and performing arts high school - multi-purpose hall located at 115-119 Great Western Highway, Emu Plains, NSW (hereinafter referred to as 'the site') as shown on Drawing 1, Appendix A.

Plans provided by SINSW showing the proposed preferred location of the multipurpose hall within the area are provided in Appendix B.

In May 2020 DP completed a Preliminary Site Investigation for contamination (PSI) (Project 92407.00.R.002.Rev0) of the site. The results of the PSI identified the following potential areas of environmental concern (PAEC) which required further investigation for the site to be considered suitable for the proposed development:

- PAEC1 - Areas where actual or potential filling has occurred, including a raised area of fill in the western portion of the site.
- PAEC2 - A former building historically located in the northern portion of the site and nearby buildings contained asbestos.
- PAEC3 - Potential for contamination of surface soils in the vicinity of the shed within central portion of the site and the LPG ASTs to the north of the shed as the result of fuel/chemical spillages/leakages and storage malpractice.
- PAEC4 - Historical turf farming and/or market gardening activities. Potential impact to shallow soils across the site.

PAEC are shown on Drawing 2, Appendix A.

This DSI is required to further investigate the above AEC to support the proposed development works and to determine potential remediation requirements for the site, if any.

The following key guidelines were consulted in the preparation of this report:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013); and
- NSW EPA *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020).

2. Scope of Works

The following scope of works was undertaken for this DSI:

- Review of previous environmental investigations and results relevant to the site;
- A site walkover undertaken immediately prior to intrusive fieldwork investigations to identify any additional AEC (beyond those identified from the PSI);
- Intrusive investigations and sample collection of the identified AEC;
- Laboratory analysis of selected soil samples for the identified contaminants of potential concern (CoPC) associated with each AEC based on the findings of the PSI and site walkover;
- Interpretation of the analytical results in accordance with current NSW EPA endorsed guidelines; and
- Preparation of this report detailing the methodology and results of the investigation, including recommendations for future remedial/management options for the site.

3. Site Information

Site Address	115-119 Great Western Highway, Emu Plains, NSW
Legal Description	Part Lot 12 / DP 1056135
Area	4,700 m^2
Zoning	Zone R2 Low Density Residential
Local Council Area	Penrith City Council
Current Use	Secondary High School

3.1 Site Description

The following site description is based on a site inspection completed on 19 September 2020, and review of Nearmap Imagery. Prominent site features are presented on Drawing 2 (Appendix A). Photographic Plates are presented in Appendix C.

The area consists mostly of vacant land covered by either grassed lawn or unsealed gravel. A shed, constructed of metal sheeting walls and roof on a concrete slab floor, is located in the south western portion of the site. Several scrap metal items and general equipment were observed in the immediate vicinity of the shed including metal gates, a car trailer, plastic spray tank for weed spraying and a number of plastic crates and buckets.

Two large aboveground storage tanks (ASTs) used for the storage of liquified petroleum gas (LPG) are located immediately north east of the shed area. The ASTs are positioned within a fenced area on a concrete slab.

An elevated fill mound is located in the western portion of the site to the west of the shed area and is mostly covered with grass and large trees. Several items of scrap metal and general discarded building materials were observed in the vicinity of the fill mound including metal sheeting, bricks, timber, and furniture.

A large skip bin is located in the northern portion of the site and, at the time of the walkover, was filled with discarded building materials including timber and metal wire. Small piles of garden mulch and woodchips are located to the east of the skip bin.

The far southern and south western portions of the site are mostly covered by grassed lawn.

3.2 Surrounding Land Use

The site is located within the grounds of the high school with classrooms located to the north, east and south east of the area and playing fields located to the west. The school is located within a residential/educational area with the land uses surrounding the school property as follows:

North:	A railway corridor with vacant land and commercial/industrial properties beyond to the far northeast.
East:	Great Western Highway with residential properties beyond.
South:	Great Western Highway with residential properties beyond.
West:	Residential properties.

3.3 Topography

Site levels are near flat at approximately RL 35 m relative to the Australian Height Datum (AHD) falling very gently towards the Nepean River located some 670 m to the southwest.

3.4 Site Geology

Reference to the 1:100 000 *Penrith* Geological Series Sheet 9030 (Edition 1, 1991) indicates that shallow soils at the site comprise Richmond Alluvial Soil Landscape (ALri) which is characterised by topography of *'Quaternary terraces of the Nepean and Georges Rivers. Mainly flat (slopes <1%). Splays and levees provide local relief (<3 m)'*. This is an alluvial landscape, which the mapping indicates comprises up to two soil horizons that range from poorly structured orange to red clay loams, clays and sands to deep acid non-calcic brown soils (Gn3.14, Gn4.34), red earths (Gn2.11) and red podzolic soils (Dr2.41), occur on terrace surfaces with earthy sands (Uc5.21, Uc1.23) on terrace edges (Penrith). These soils are associated with high erosion hazard on terrace edges and minor localised flooding.

Reference to the Penrith 1:100 000 Geological Series Sheet indicated that the site is underlain by Alluvial Terrace Deposits (Q at) of quaternary age. This formation typically comprises Silt, clay, (fluvially-deposited) fine- to medium-grained quartz-lithic sand, polymictic gravel.

3.5 Acid Sulphate Soils

Review of the NSW Government Office of Environment and Heritage Acid Sulfate Soils Risk mapping (Prospect/Parramatta River Map No. 9130N3) indicates that the site is classified as having *'no known occurrence of acid sulfate soil'.*

3.6 Surface Water and Groundwater

The nearest surface water body is the Nepean River located approximately 670 m south west down-gradient of the site.

A search of the NSW Office of Water groundwater bore data was undertaken by DP on 14 April 2020 identified two registered bores within 500 m of the site. Table 2 below provides a summary of information for the two identified bores.

Table 2: Summary of Groundwater Bore Search

Bore ID	Approx. Distance (m) / Direction from Site	Date of Installation	Bore Use	Total Depth (m)	Depth of Water Bearing Zones (m)
GW017621	North/480 m	Not provided	Industrial	12.8	7.6 – 9.1
GW021872	South east/300 m	01/05/1964	General use	7.9 m	6.0 – 7.8 m

Based on the regional topography and the inferred flow direction of nearby water courses, the anticipated flow direction of groundwater beneath the site is to the south west, towards the Nepean River, the likely receiving surface water body for the groundwater flow path. On this basis neither well is located down gradient of the site. Given the local geology (ie: alluvial soils and likely underlying Hawkesbury Sandstone), the groundwater in the rock beneath the site is anticipated to be relatively fresh. Accordingly, potential beneficial uses could include irrigation or drinking water, although the future use of the groundwater for these purposes in the vicinity of the site is considered unlikely given the urban setting.

3.7 Sensitive Receptors and Environments

The nearest sensitive receptors and environments have been identified as follows:

- Current and future site occupants of the school and the surrounding school grounds, including users of classrooms and playgrounds;
- Nearby residential and commercial properties;
- The closest primary environmental receptor down-gradient of the site is the Nepean river located approximately 670 m south west of the site;
- Groundwater beneath the site;
- Construction workers; and
- Future utility/maintenance workers.

4. Previous Environmental Investigations and Reports

4.1 Noel Arnold & Associates (May 2008) Asbestos Register (Hazardous Materials and Risk Assessment)

SINSW provided DP the Asbestos Register produced for the school by Noel Arnold & Associates (NA) in 2008. The register was reviewed by Parson Brinckerhoff in 2017. Asbestos was visually identified and detected by the laboratory within samples collected from several of the school structures inspected, including the following:

- Several of the wall panels of school buildings;
- Packing joints in several of the underfloor voids;
- Fume cupboard materials;
- Sheeting in the eaves of the multipurpose hall;
- Sheeting in several of the ceiling structures;
- Vinyl tiles (including under carpeted areas);
- Within debris on floors of several plant rooms; and
- Flue pipes.

The inspection was limited to accessible areas and did not extend to areas hidden from view or encapsulated such as any wall cavity, subfloor areas and services.

4.2 DP (May 2020) Preliminary Site Investigation

DP completed a PSI of the Site in May 2020. A site walkover and a desktop review of site history information was undertaken to identify Potential Areas of Environmental Concern (PAEC) and contaminants of potential concern (CoPC) which may arise from previous land uses.

The results of the PSI desktop investigation identified that the site and surrounds have an earlier history of rural land use and then later for educational land-use purposes with the site being used as a secondary high school. The following PAEC were identified from desktop and site walkover investigations that had the potential for contamination of site soils:

- Areas where actual or potential filling has occurred including a raised area of fill in the western portion of the site;
- A former building historically located in the northern portion of the site and nearby buildings contained asbestos. Therefore the potential impact to shallow soil from hazardous building materials existed;
- Potential for contamination of surface soils in the vicinity of the shed within the central portion of the site and the LPG ASTs to the north of the shed as the result of fuel/chemical spillages/leakages and storage malpractice; and
- Historical turf farming and/or market gardening activities. Potential impact to shallow soils across the site.

The presence or extent of potential contamination was not confirmed in the PSI. The PSI concluded that further assessment of soil at the site would be required to assess the presence, degree and extent of contamination and any remediation requirements associated with the potential contamination source(s) identified.

5. Conceptual Site Model

The CSM, shown in Table 3, has been derived from the PSI and made relevant for the site.

Table 3: Conceptual Site Model

Potential Source	Exposure Pathway	Receptor	Requirement for Additional Data and / or Management
S1 (PAEC1): Presence of fill S2 (PAEC2): Hazardous building materials S3 (PAEC3): Potential chemical storage S4 (PAEC4): Turf farming and/or market gardening	P1 – Ingestion and dermal contact; P2 – Inhalation of fibres and/or dust and/or vapours P3 – Leaching of contaminants and vertical migration into groundwater. P4 – Surface water run-off. P5 – Lateral migration of groundwater providing baseflow to watercourses. P6 – Direct contact of contaminated ground with ecological receptors.	R1 - Construction workers during construction and maintenance/utility workers and in the future. R2 – Current and future site users following development of the site. R3 – Land users in adjacent areas. R5 – Surface water bodies. R6 – Local groundwater and receiving water bodies. R4 – Local ecology.	Given the identified potential contaminant sources, the initial fate (lay down mechanism) of potential contaminants is likely to be expressed firstly in surface and shallow soils. An intrusive investigation is therefore required to quantify and assess potential contamination impact to surface/shallow soils. (A further assessment of deeper soils and groundwater may be deemed necessary should significant contamination be identified in surface/shallow soils).

6. DSI Field Work - Soil Sampling

DSI fieldwork was completed at the site on 19 and 20 September 2020 to assess the AEC identified in the PSI requiring further investigation (Discussed in Section 4.2). Photographic plates are presented in Appendix C.

The field investigation was designed in accordance with the seven step data quality objectives (DQO) process provided in Appendix D, Schedule B2 of the National Environment Protection (Assessment of Site Contamination) Measure 1999 as amended 2013 (NEPC, 2013). The DQO adopted for this DSI are provided in Appendix D.

Soil sample locations are shown on Drawing 3, Appendix A. Soil sampling was completed at the majority of locations by boring with a with a Geoprobe drilling rig fitted with a 150 mm diameter solid flight auger to a maximum depth of 6.0 metres below ground level (m bgl).

The following scope was completed for assessment of the AEC on site:

- Drilling of 13 bore holes (BH1 to BH13) on an approximate 19 m grid across the site to investigate the potential for shallow soil and/or fill contamination. The number of sampling points satisfies NSW EPA sampling requirements for the area of the site (total area of approximately 4,700 m^2);
- Some grid locations were locally adjusted so that grid locations are located closer to the identified point sources such as:
    - BH1 and BH13 located in the vicinity of the building where hazardous building materials have been identified;
    - BH11 and BH12 located in the vicinity of a former building structure that may have contained hazardous building materials;
    - BH5 and BH6 located in the vicinity of shed and storage area to investigate potential for impact to shallow soil from fuel/chemical spillages/leakages and storage malpractice;
    - BH9 located in the vicinity of the LPG tanks to investigate potential for impact to shallow soil from fuel/chemical spillages/leakages and storage malpractice; and
    - BH3, BH4, BH7 and BH10 located in the western portion of the site to investigate potential shallow soil impact from fill and historical turf farming and/or market gardening activities.
- Collection of shallow (<0.3 m bgl) fill or soil samples at all locations;
- All primary shallow soil samples were analysed for the following COPC associated with identified sources including:
    - Total Recoverable Hydrocarbons (TRH);
    - Benzene, toluene, ethylbenzene and xylenes (BTEX); and
    - Polycyclic aromatic hydrocarbons (PAHs).
    - Polychlorinated biphenyls (PCBs);
    - Heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn);
    - Organochlorine pesticides (OCPs);
    - Organophosphate pesticides (OPPs); and
    - Asbestos.

6.1 Soil Sampling Procedure and QA/QC

All sampling data was recorded on DP bore logs (Appendix E) with samples also recorded on chain-of-custody (CoC) sheets. The general sampling procedure adopted for the collection of environmental soil samples is summarised below:

- Collection of soil samples was completed using disposable sampling equipment (new nitrile gloves for each sample) from the drilling auger. Samples were collected taking care to not include soil that was directly in contact with the surface of the auger;
- Transfer of samples into laboratory-prepared glass jars, completely filled to ensure the headspace within the sample jar was minimised, and capping immediately to minimise loss of volatiles;
- Labelling of the sample containers with individual and unique identification details, including project number, sample location and sample depth;
- Placement of the glass jars, with Teflon lined lid, into a cooled, insulated and sealed container for transport to the laboratory; and
- Collection of additional replicate samples at a rate of 10% for QC requirements.

Samples designated for analysis were dispatched to NATA accredited laboratory Envirolab Services at Chatswood NSW for analysis of primary samples and intra-laboratory replicates.

6.2 Site Assessment Criteria

The Site Assessment Criteria (SAC) applied in this DSI have been informed by the proposed land use and the PSI CSM - which identified human and ecological receptors to potential contamination on the Site. Analytical results were assessed (as a Tier 1 assessment) against the investigation and screening levels presented in Schedule B1 of the ASC NEPM (NEPC, 2013).

Recreational land use criteria with accessible soil (HIL C) were adopted given the site is currently a secondary school (as required by the ASC NEPM). Where required, the derivation of some SAC is included in Appendix D and the adopted SAC are listed in the analytical results table (Table F1 in Appendix F).

7. Field Work Observations and Results

7.1 Observations

Relatively uniform geological conditions were encountered across most of the Site and generally included the following strata:

- Fill or silty sand topsoil, comprising minor gravel inclusions and rootlets encountered from surface to 0.4 m bgl; overlying;
- Silty clayey sand encountered at depths from 0.1 to 1.0 m bgl; and overlying
- Sand comprising medium dense alluvial sand encountered at depths from 0.5 to 3.5 m bgl; overlying
- Sand comprising minor gravel and cobble inclusions to the maximum depths of the investigation of 6.0 m bgl.

Traces of anthropogenic material including fragments of bricks were encountered in fill at borehole location BH6.

7.2 Laboratory Analytical Results

The analytical results for the soil samples collected during this DSI are summarised in Tables F1 and F2 in Appendix F, together with the adopted SAC. The laboratory certificate of analysis for this DSI is provided in Appendix G.

Concentrations of COPC were reported below the adopted SAC in all samples analysed with the exception of the following:

- Sample BH12/0.05-0.1 m bgl - Chrysotile asbestos was identified embedded in a fragment of fibre cement (FC), it is estimated to be 0.07 g/kg in 51.20g of soil (<reporting limit for the method of 0.1g/kg);
- Sample BH7/0.0-0.1 – TRH in the form of F2 (C_{10}-C_{16}) and F3 (C_{16}-C_{34}) compounds were detected at concentrations (F2 at 150 mg/kg and F3 at 1300 mg/kg) exceeding the ecological investigation levels (F2 – 120 mg/kg, F3 – 300 mg/kg); and
- Sample BH11/0.0-0.1 – Benzo(a)pyrene was detected at a concentration (0.8 mg/kg) marginally exceeding the ecological investigation level (0.7 mg/kg).

7.3 Quality Assurance and Quality Control Assessment

The field and laboratory quality assurance and quality control procedures and results are provided in Appendix H. In summary, the results are considered to be reliable and useable for this investigation.

8. Additional Sampling

Chrysotile asbestos was detected by the laboratory in a fragment of FC collected from the shallow fill (0.05 - 0.1 m bgl) within the carpark area in the north eastern portion of the site at borehole location BH12. Whilst the asbestos content within the soil sample was below the laboratory reporting limits and no other fragments were visibly identified on surface soils or detected by the laboratory from remaining collected samples further assessment for any additional fragments that may have been buried or existed within fill in the vicinity of BH12 was undertaken.

To determine whether the identified fragment of ACM at BH12 was an anomalous/isolated fragment or indicative of wide-spread ACM impact of fill soils in the north eastern portion of the site the following was completed on 24 October 2020:

- Completion of 12 grid-based test pits (TP101 to TP112) by hand across the carpark area and collection of shallow soil samples (500 ml) from encountered fill. The additional testpit/soil sample locations are shown on Drawing 4, Appendix A. 10 L bulk samples were also collected from encountered fill where possible at locations TP101 to TP106, TP109, TP113, TP114 and TP115. Due to the significant thickness of encountered asphalt at locations TP107, TP108, TP111 and TP112 the 10L bulk samples could not be collected. For the estimated total carpark area (an estimated total approximate area of 0.1 ha) the grid size selected satisfies the 2 × sample grid (double density) recommended by WA DoH (2009) for areas where there is likely potential for asbestos. The grid was also positioned so that one of the grid based test pits (TP101) was located in the immediate vicinity (<1m from BH12) of BH12 and another two (TP102 and TP105) were also positioned close by (approximately 4m from BH12) to assess the lateral extent of asbestos impact;
- An additional 500 mL sample of deeper fill (0.2 - 0.3 m bgl) was also collected at test pit location TP101 to assess the potential vertical extent of asbestos impact and to assess whether the asbestos previously identified was associated with either the shallower or deeper layers of fill at BH12;
- Laboratory analysis of 13 samples (500ml) for quantitative asbestos analysis; and
- The 10 L bulk soil samples were inspected in accordance with WA DoH (2009) gravimetric method.

In addition a further three testpits (TP113 to TP115) were completed within the proposed building footprint (ie: outside of the carpark) and samples (500 ml and 10 L bulk) collected from within the shallow fill for quantitative analysis (500 ml) and inspection of the bulk samples as per WA DoH (2009) gravimetric method.

8.1 Additional Sampling Laboratory Analytical Results

The laboratory analytical results for the samples collected during additional sampling are summarised in Table F3 in Appendix F, together with the adopted SAC. The laboratory certificate of analysis for additional sampling is also provided in Appendix G.

Asbestos was not detected in any of the additional soil samples (500 ml and 10L bulk) collected and analysed.

9. Discussion

9.1 ACM Fragment in North Eastern Portion of Site

Laboratory analysis of a soil sample collected from shallow fill in the north eastern portion of the site at testpit TP12 identified chrysotile asbestos within a fragment of fibre cement material within the sample. The fragment of ACM at TP12 is however considered likely to be isolated occurrence and not indicative of widespread impact given:

- Site walkover undertaken during initial sampling and additional sampling did not identify any additional fragments on the site surface across the north eastern portion and remainder of the site;

- Further shallow fill sampling at and surrounding TP12 did not identify asbestos within any of the soil samples (500 ml and 10L bulk) subject to quantitative asbestos analysis with reference to the WA DoH (2009) methods; and
- The only fragment of ACM found (at TP12) during the investigations was removed in the soil sample for laboratory testing.

9.2 TRH impact to Soil in the West of the Site (BH7)

TRH in the form of F2 (C_{10}-C_{16}) and F3 (C_{16}-C_{34}) compounds were detected at concentrations (F2 at 150 mg/kg and F3 at 1300 mg/kg) exceeding the ecological investigation levels (F2 – 120 mg/kg, F3 – 300 mg/kg) in the fill sample (BH7 at a depth of 0.0-0.1) collected from the western portion of the site.

Following receipt of initial laboratory results a silica gel clean-up was requested on the sample to remove interferences from non-petroleum hydrocarbons. The results of silica gel cleanup did not identify TRH at concentrations above laboratory reporting limits in the sample.

The elevated TRH levels detected in the sample collected from fill is therefore considered likely due to the organic material interference within the fill sample.

9.3 BaP impact to Soil in the North of the Site (BH11)

BaP was identified at a concentration (0.8 mg/kg) marginally exceeding the ecological investigation level (0.7 mg/kg) in a soil sample collected from shallow fill in borehole BH11 at a depth of 0.0 – 0.1 m bgl.

The BaP concentration at BH11 is however not considered to affect the suitability of the site for the proposed development given:

- The marginal nature of the exceedance (the concentration did not exceed 250% of SAC);
- The BaP identified in fill at the site is likely to be aged and therefore likely to have a reduced ecological bioavailability of the contaminant;
- The concentration of BaP is significantly lower than the revised high reliability ecological guideline of 33 mg/kg (95% confidence) as presented in the Cooperative Research Centre for Contamination Assessment and Remediation of the Environment (CRC Care, 2017) Technical Report No. 39 - *Risk-based Management and Remediation Guidance for Benzo(a) pyrene* - This document and ecological guideline was developed subsequent to NEPM (2013, amended);
- Concentrations of BaP were not detected at levels exceeding SAC in remaining samples collected across the site indicating the extent of BaP impact is limited in extent and not indicative of widespread gross impact; and
- Given the proposed development in the northern portion of the site will include likely import of topsoil for turf and gardens, ecological access to the soils with marginally exceeding EILs for BaP in the final development is likely to be highly limited.

10. Waste Classification

Laboratory results of soil samples were also compared against contaminant threshold (CT) values as presented in Table 1 of the NSW Environment Protection Authority (EPA) *Waste Classification Guidelines, Part 1: Classifying Waste*, November 2014 (EPA, 2014). The analytical results for the waste classification soil samples collected are summarised in Table I1 (Appendix I), together with the adopted CT values.

COC were not detected at concentrations exceeding General Solid Waste CT values in all soil samples analysed.

10.1 Fill Waste Assessment

The following Table 2 presents the results of the six-step procedure outlined in EPA (2014) for determining the type of waste and the waste classification. This process applies to the fill at the site.

Table 2: Six Step Classification Procedure

Step	Comments	Rationale
1. Is the waste special waste?	No	A small fragment of ACM (<reporting limit for the method of 0.1 g/kg) was identified within a fill sample collected from BH12 completed in the north eastern portion of the site. The fragment was considered an isolated occurrence and not indicative of widespread impact as discussed in section 9. No other ACM, clinical or related waste, or waste tyres were observed in the remaining bore holes and testpits completed. Asbestos was not detected by the analytical laboratory in remaining samples analysed.
2. Is the waste liquid waste?	No	The fill comprised a soil matrix.
3. Is the waste "pre-classified"?	No	The waste is not pre-classified.
4. Does the waste possess hazardous waste characteristics?	No	The waste was not observed to contain or considered at risk to contain explosives, gases, flammable solids, oxidising agents, organic peroxides, toxic substances, corrosive substances, coal tar, batteries, lead paint or dangerous goods containers.
5. Determining a wastes classification using chemical assessment	Conducted	Refer to Table I1 (attached). It is noted that chemical assessment for lead is not required for lead paint impacted soil given its pre-classification (see point 3, above)
6. Is the waste putrescible or non-putrescible?	No	The fill does not contain materials considered to be putrescible.

Based on the observations at the time of sampling and the reported analytical results, the fill within the site as shown on Drawing 1 (Appendix A), is classified as **General Solid Waste (non-putrescible),** as defined in EPA (2014).

The presence of building rubble is used as a possible indicator of asbestos. In the instance that asbestos is found in other areas the classification should revert to Special Waste Asbestos and the soil will not be suitable to be sent to a recycling facility.

10.2 VENM Assessment

The following Table 3 presents the results of the assessment of natural soils and bedrock at the site with reference to the VENM definition.

Table 3: VENM Classification Procedure

Item	Comments	Rationale
1. Is the material natural?	Yes	Natural soil logged in the bore logs (refer Section 7).
2. Is the material impacted by manufactured chemicals or process residues?	No	There were no visual indicators of chemical contamination of the materials in the bore logs. Contaminant concentrations were within the typical background levels (refer to Table F1, attached).
3. Are the materials acid sulphate soils?	No	A review of the Acid Sulfate Soil Risk Map shows the site in an area of no ASS occurrence.
4. Are there current or previous land uses that have (or may have) contaminated the material.	No	Review of previous reports indicate that previous land uses has a low potential for contamination. The low chemical concentrations reported in the samples tested indicate no likely impact on the natural materials.

Based on the site history, field observations and the analytical results, the in situ natural material present underlying the fill within the site shown on Drawing 1 (Appendix A), comprising silty clay and shale, is classified as VENM.

The materials classified as VENM are pre-classified as General Solid Waste (non-putrescible) under EPA (2014). Furthermore, VENM may be applied to land in an off-site location without the requirement of a licence under the POEO Act.

11. Conclusions and Recommendations

The results of the previous PSI identified that the site and surrounds had a history of rural land use and more recently educational land-use, with the site being used as a secondary high school. The results of the PSI identified the following potential areas of environmental concern (PAEC) which required further investigation for the site to be considered suitable for the proposed development:

- PAEC1 - Areas where actual or potential filling has occurred including a raised area of fill in the western portion of the site;

- PAEC2 - A former building historically located in the northern portion of the site and nearby buildings contained asbestos;
- PAEC3 - Potential for contamination of surface soils in the vicinity of the shed within central portion of the site and the LPG ASTs to the north of the shed as the result of fuel/chemical spillages/leakages and storage malpractice; and
- PAEC4 - Historical turf farming and/or market gardening activities. Potential impact to shallow soils across the site.

Initial soil sampling was undertaken during this DSI at 13 locations on an approximate 19 m grid across the site to investigate the potential for shallow soil and/or fill contamination associated with the above mentioned PAEC. Laboratory analysis of one soil sample collected from shallow fill at testpit BH12 completed in the carpark area in the north eastern portion of the site identified chrysotile asbestos within a fragment of fibre cement material within the fill sample.

Other COPC were not detected in samples collected during the initial sampling at concentrations that would present a human health or ecological risk for the proposed development.

Additional testpit sampling at 12 locations completed within the carpark area and another three within the proposed building footprint did not identify further fragments or asbestos in soils therefore the ACM fragment identified at BH12 is considered likely to be an anomalous/isolated occurrence (since removed) and not indicative of widespread impact.

From a contamination perspective, based on the findings of this DSI and previous PSI, it is concluded that no further investigations or remediation works are warranted for the site.

Notwithstanding the above a potential still exists for isolated occurrences of ACM to be encountered during any future soil disturbance given the following:

- The limitations associated with grid-based sampling and the potential for undetected variations of fill to exist between sampling locations; and
- The identification of the aforementioned fragment of ACM.

It is therefore recommended that an Unexpected Finds Protocol be prepared and implemented to provide a formal contingency to be followed in the event of an unexpected find with respect to potential site contamination issues encountered during any bulk earthworks.

12. Limitations

Douglas Partners Pty Ltd (DP) has prepared this report for this project at 115 - 119 Great Western Highway, Emu Plains in accordance with DP's proposal SYD200799 dated 04 August 2020 and acceptance received from Mr Paul Biswajit dated 21 September 2020. The work was carried out under contract no SINSW01014/20). This report is provided for the exclusive use of School Infrastructure NSW for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached notes and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

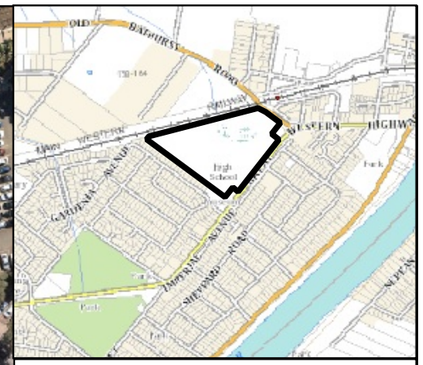
This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

The contents of this report do not constitute formal design components such as are required, by the Health and Safety Legislation and Regulations, to be included in a Safety Report specifying the hazards likely to be encountered during construction and the controls required to mitigate risk. This design process requires risk assessment to be undertaken, with such assessment being dependent upon factors relating to likelihood of occurrence and consequences of damage to property and to life. This, in turn, requires project data and analysis presently beyond the knowledge and project role respectively of DP. DP may be able, however, to assist the client in carrying out a risk assessment of potential hazards contained in the Comments section of this report, as an extension to the current scope of works, if so requested, and provided that suitable additional information is made available to DP. Any such risk assessment would, however, be necessarily restricted to the environmental components set out in this report and to their application by the project designers to project design, construction, maintenance and demolition.

Douglas Partners Pty Ltd

Appendix A

Drawings 1 to 4



Site Locality

Legend

- Site boundary
- Lot Boundary
- Proposed Hall Footprint Orientation
- Proposed hall areas including surrounding works

50 0 50 100 150 200 m

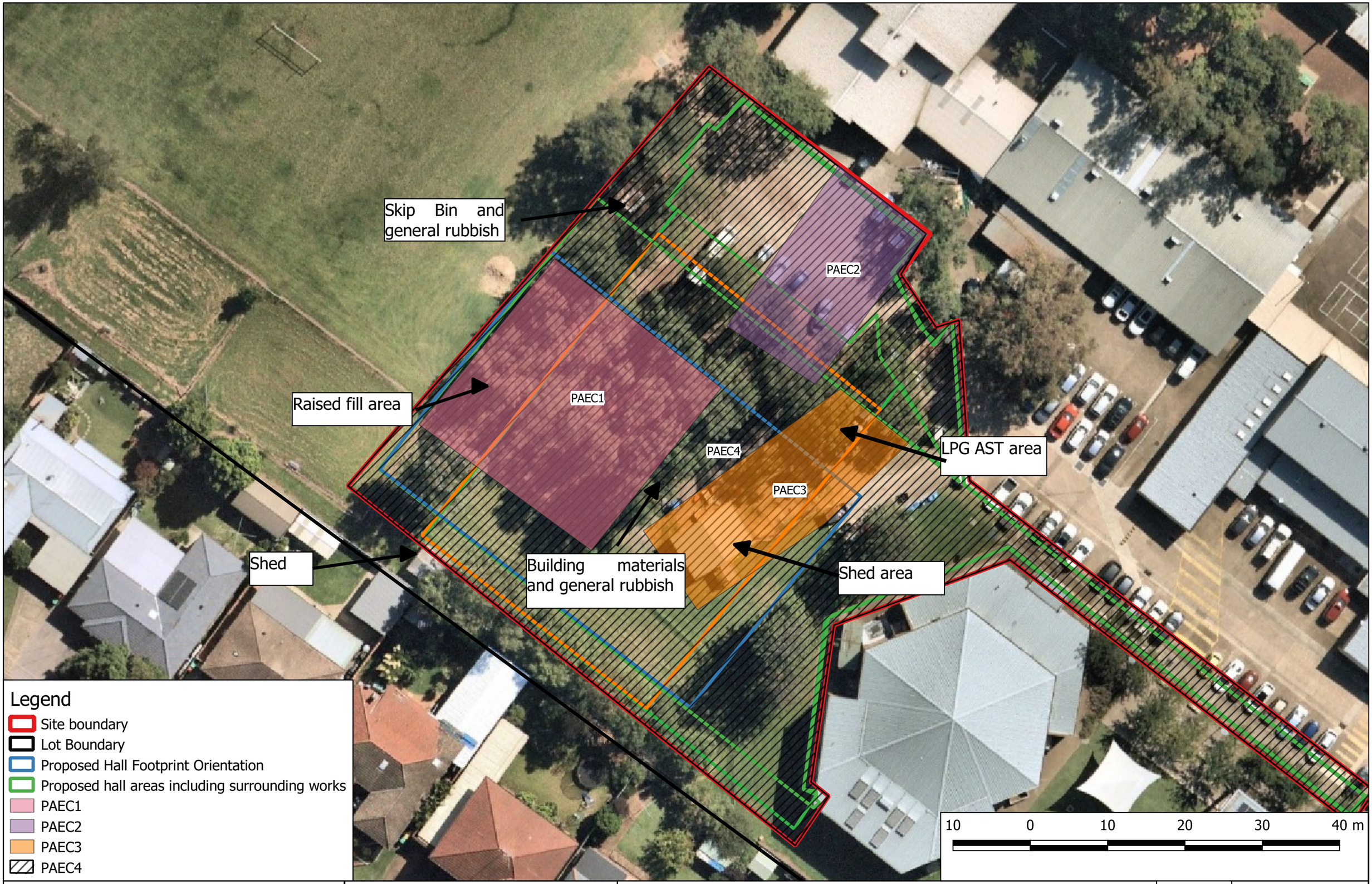
Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: School Infrastructure NSW		
OFFICE: Macarthur	DRAWN BY: GAR	
SCALE: As shown	DATE: 2/11/20	

TITLE: **Site Layout and Locality**
Detailed Site Investigation for Contamination
Nepean Creative and Performing Arts High School
115 - 119 Great Western Highway, Emu Plains NSW

N
MGA

PROJ. #: 92407.02	
DRAWING No:	1
REVISION:	0



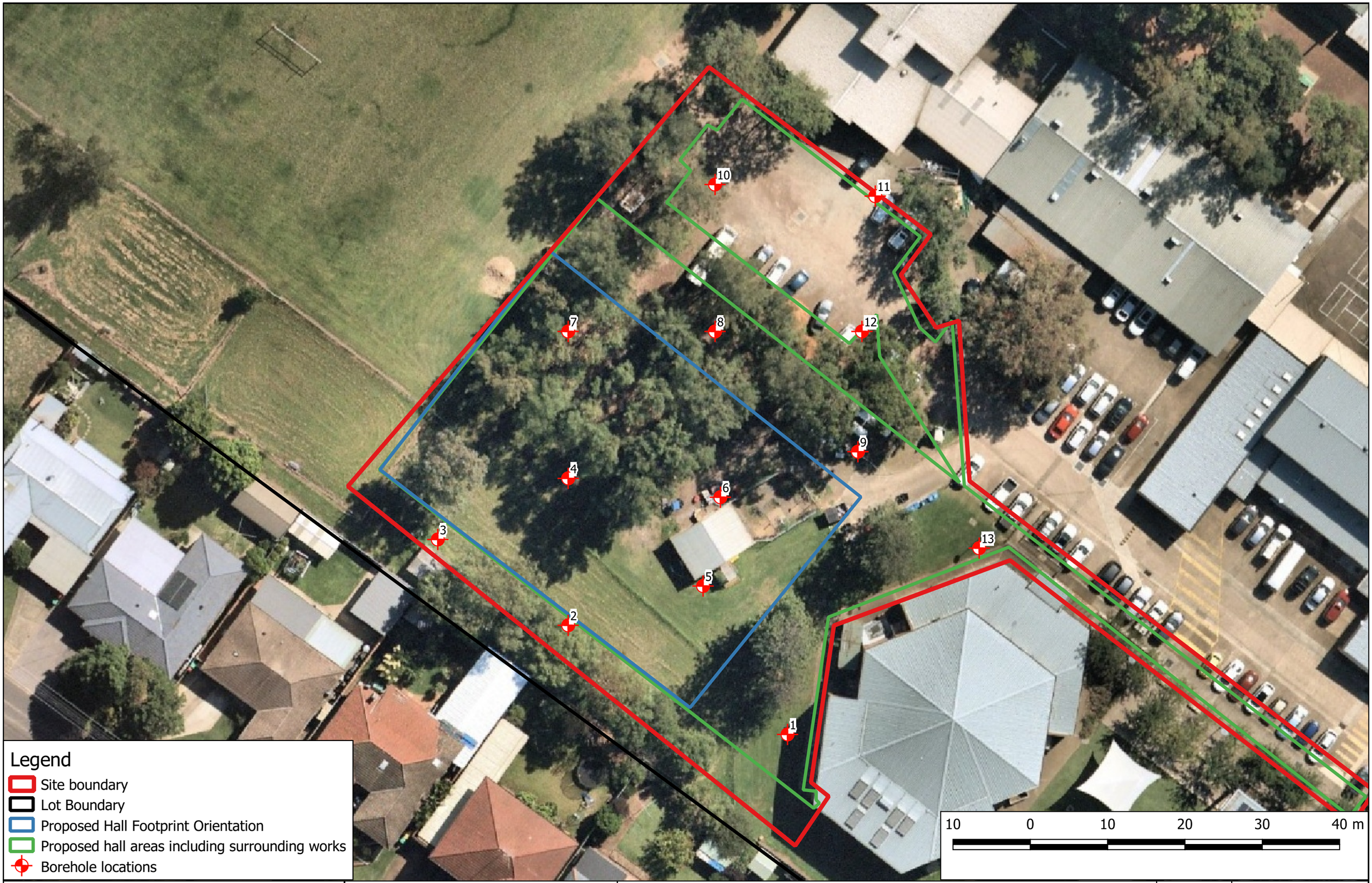
Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: School Infrastructure NSW		
OFFICE: Macarthur	DRAWN BY: GAR	
SCALE: As shown	DATE: 2/11/20	

TITLE: **Site Features**
Detailed Site Investigation for Contamination
Nepean Creative and Performing Arts High School
115 - 119 Great Western Highway, Emu Plains NSW

N
MGA

PROJ. #: 92407.02	
DRAWING No:	2
REVISION:	0



Legend

- Site boundary
- Lot Boundary
- Proposed Hall Footprint Orientation
- Proposed hall areas including surrounding works
- Borehole locations

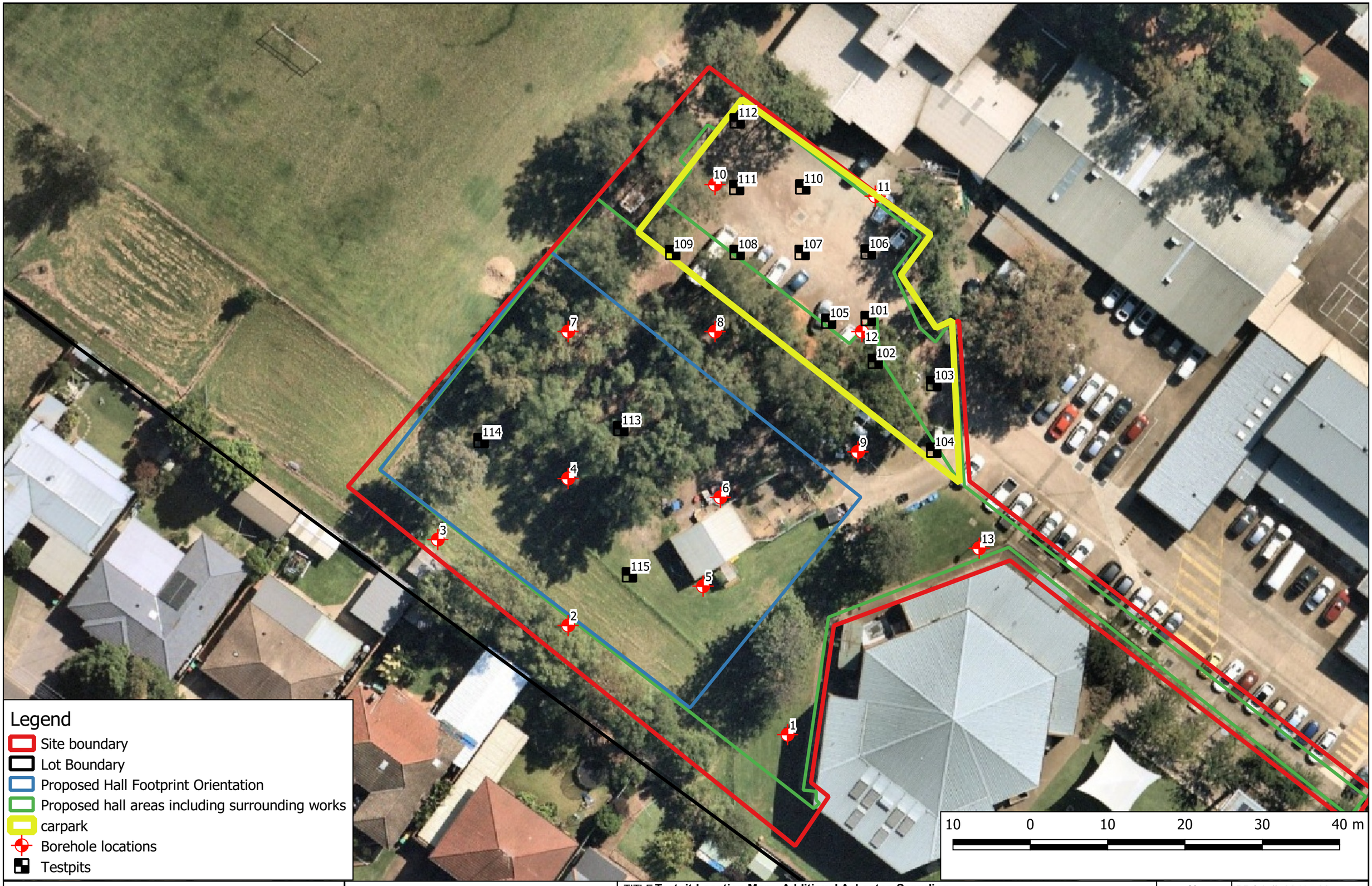
Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: School Infrastructure NSW		
OFFICE: Macarthur	DRAWN BY: GAR	
SCALE: As shown	DATE: 2/11/20	

TITLE: **Borehole Location Map - Initial Sampling**
Detailed Site Investigation for Contamination
Nepean Creative and Performing Arts High School
115 - 119 Great Western Highway, Emu Plains NSW

N
MGA

PROJ. #: 92407.02	
DRAWING No:	3
REVISION:	0



Legend

- Site boundary
- Lot Boundary
- Proposed Hall Footprint Orientation
- Proposed hall areas including surrounding works
- carpark
- Borehole locations
- Testpits

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: School Infrastructure NSW		
OFFICE: Macarthur	DRAWN BY: GAR	
SCALE: As shown	DATE: 2/11/20	

TITLE: **Testpit Location Map - Additional Asbestos Sampling**
Detailed Site Investigation for Contamination
Nepean Creative and Performing Arts High School
115 - 119 Great Western Highway, Emu Plains NSW

N
MGA

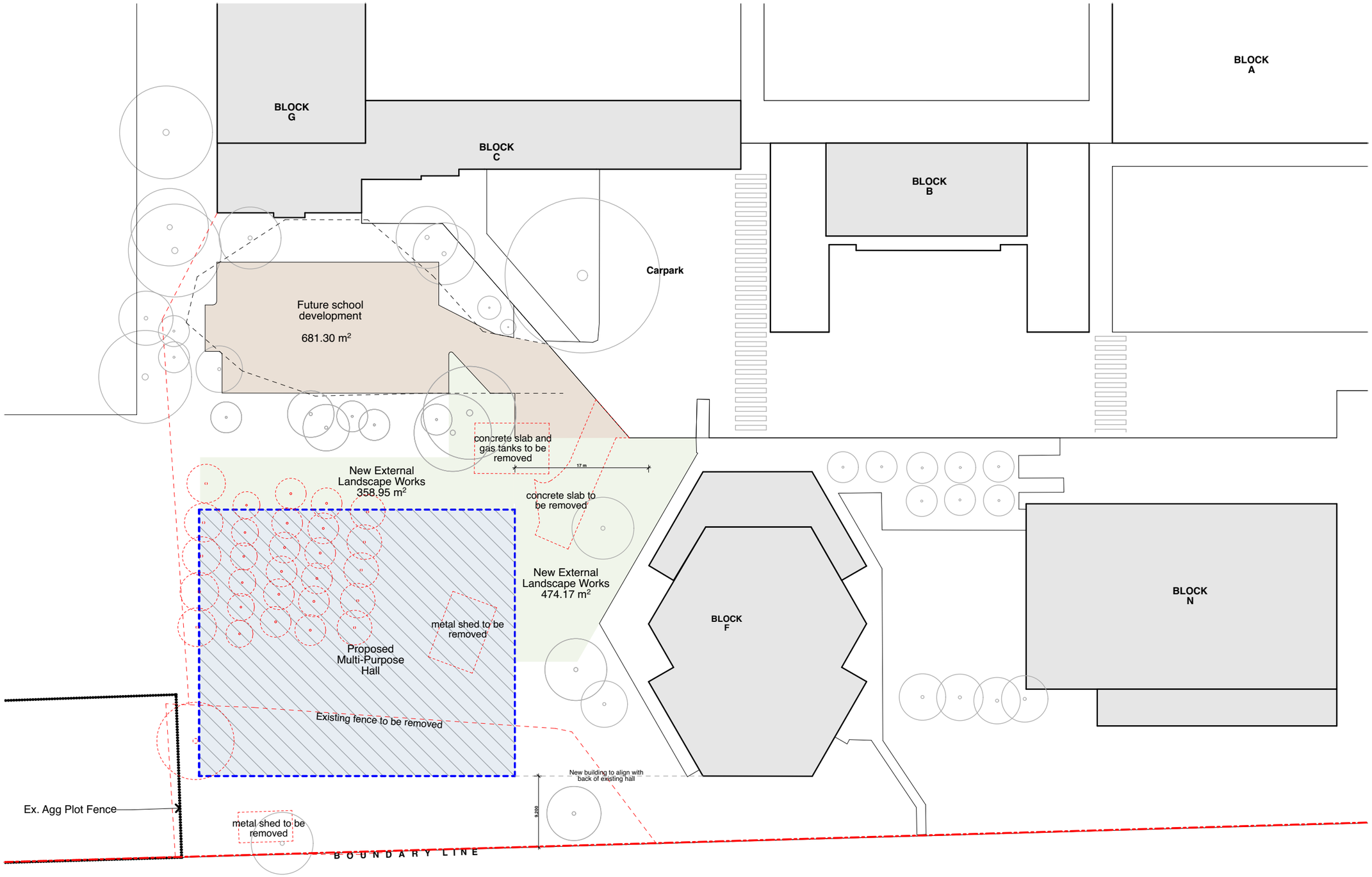
PROJ. #: 92407.02	
DRAWING No:	3
REVISION:	0

Appendix B

SINSW Plans

06 Concept Design

Developed Concept Option 4A: Site Plan (Prefered option)



06 Concept Design

Developed Concept Option 4A: Floor Plan Assembly Layout (Preferred option)

Siting

Floor level set at a level relative to the existing walkway / carpark levels.

Main entry point to building – North East end of building. Convenient for access from Carpark.

Accessibility achieved without requiring 1:14 ramp (1:20 walkway only).

Removal of trees, waste storage area, shed, gas tanks and fencing required for siting building. Replacement locations TBC.

Minimum 9.2 m setback from southern boundary.

Future expansion of existing carparking possible by school. New crossing proposed for safe pedestrian link across carparking.

New courtyard space between proposed hall and Block F (Existing Hall)

Minor landscaping works between new building and existing trees north/east of building

Plan

Foyer space – Suitable entrance, gathering space before entering main court. Potential for awning to help highlight entrance.

Alternative entry / exit points along three sides of court leading to external areas.

Change rooms positioned at southern end. Allowance for portable stage.

Ancillary spaces positioned along the southern end (preferred as more of the courtyard can be activated).

Building Form

Main court space requires clear height of 7metres (National Standards for indoor Basketball Courts). This generates a minimum springing point for main roof.

Main roof to cover stage area – to allow sufficient ceiling height over stage. Main roof has the potential to open up towards the north east with potential for high light windows.

All other ancillary spaces including foyer, toilets, store rooms etc and the covered walkway can have reduced ceiling heights – Approximately 3m. Roof elements along these elements could contrast with that of the main roof.

Main roof has the potential for high light windows.

Sports Mode Layout

Netball 30.5 × 15.25m

Basketball 28 × 15m

Badminton 13.4 × 6.1m

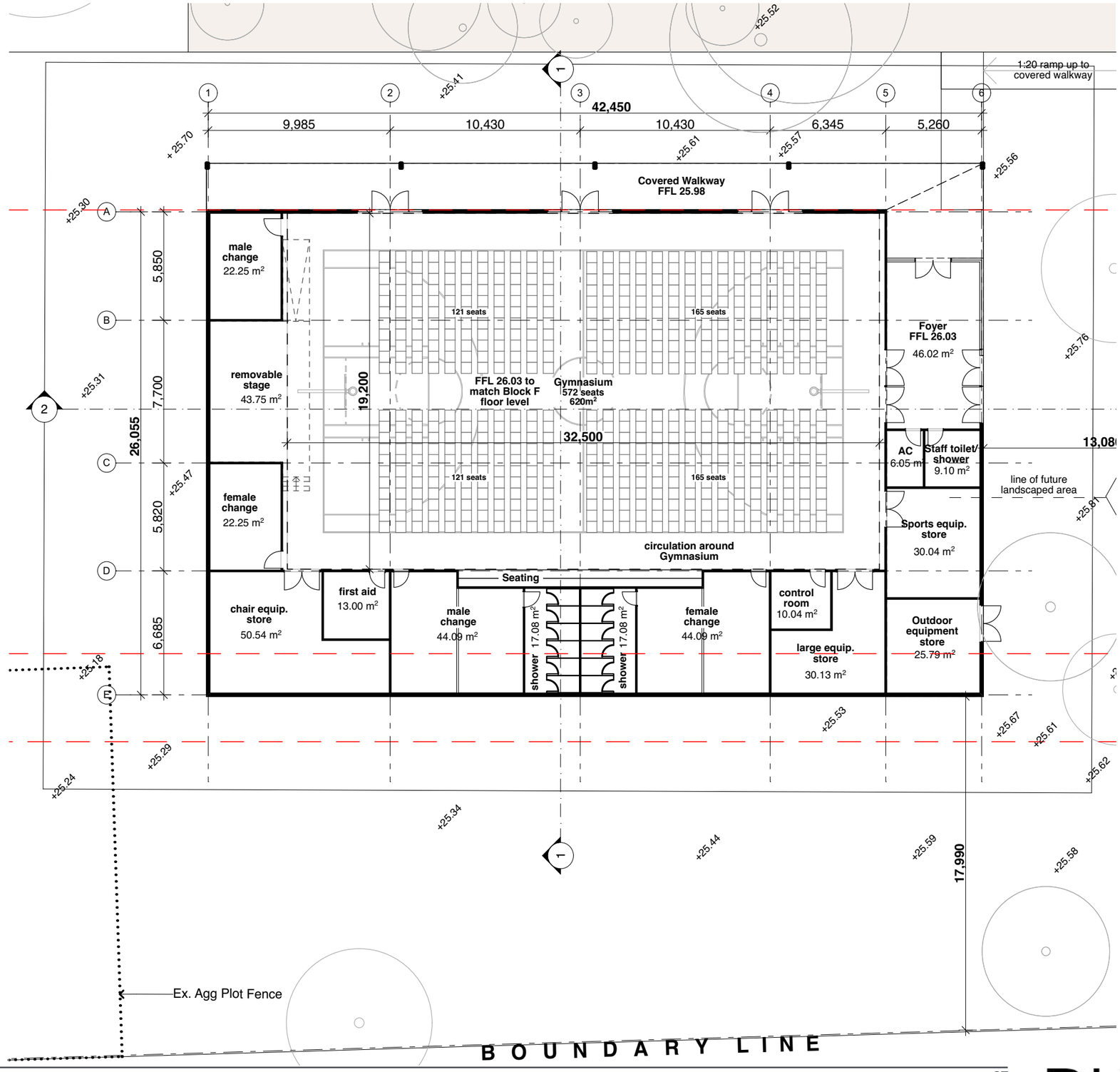
Volleyball 16 × 8m

EFSG requirement is 2000mm minimum to obstruction from side lines.

Performance Mode Layout

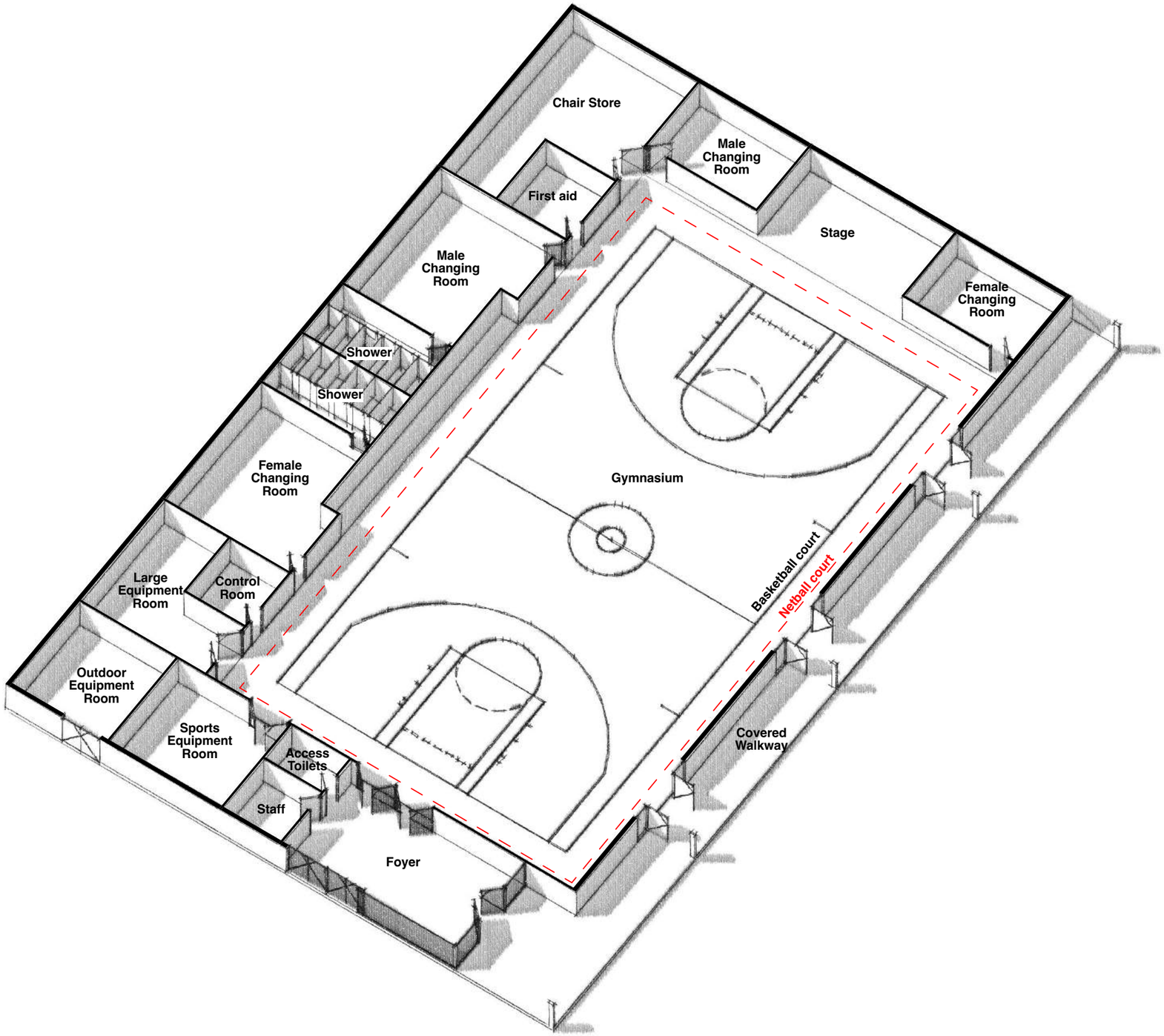
Loose seating – up to 572 seats

Allowance for portable stage



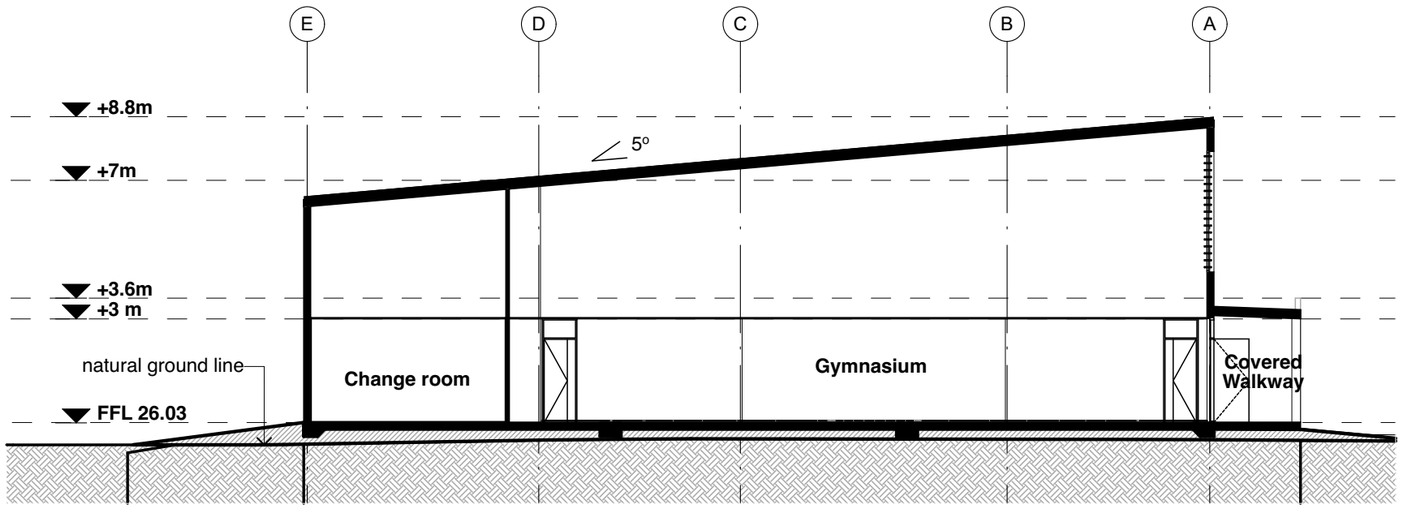
06 Concept Design

Developed Concept Option 4A: Floor Plan Sporting Layout (Preferred option)

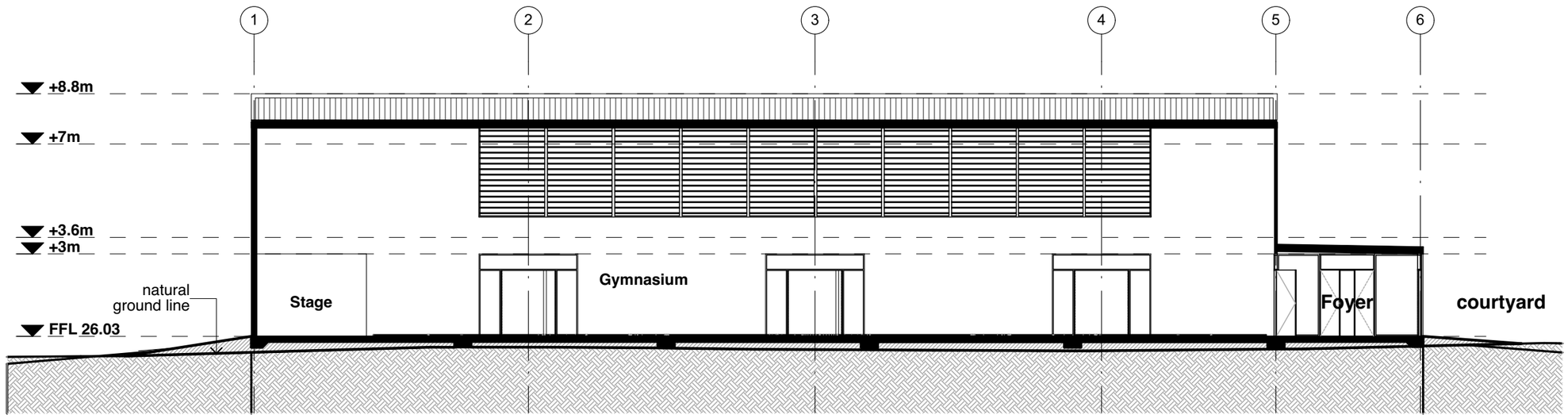


06 Concept Design

Developed Concept Option 4A: Sections (Preferred option)



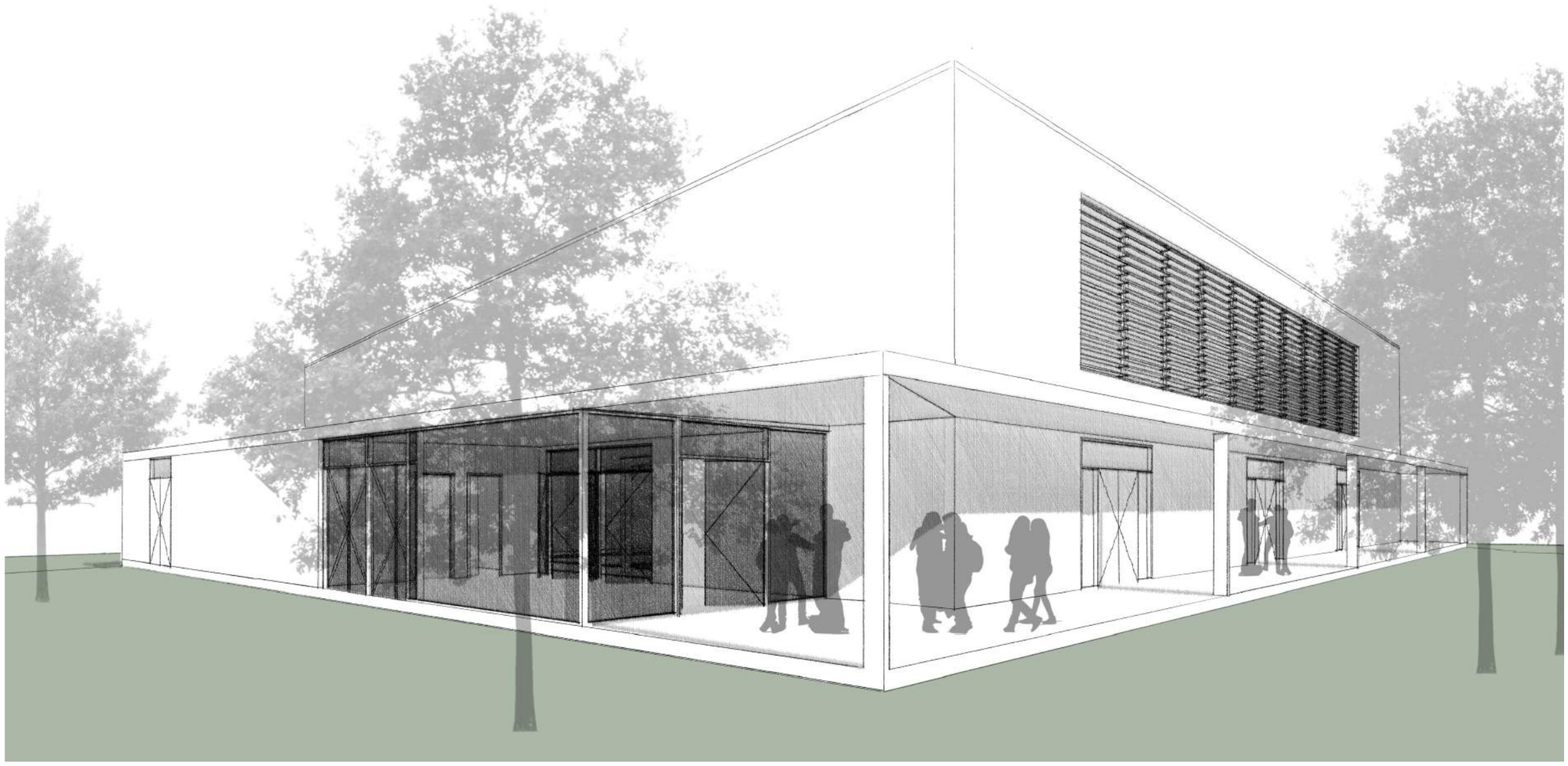
Section 1 1:200



Section 2 1:200

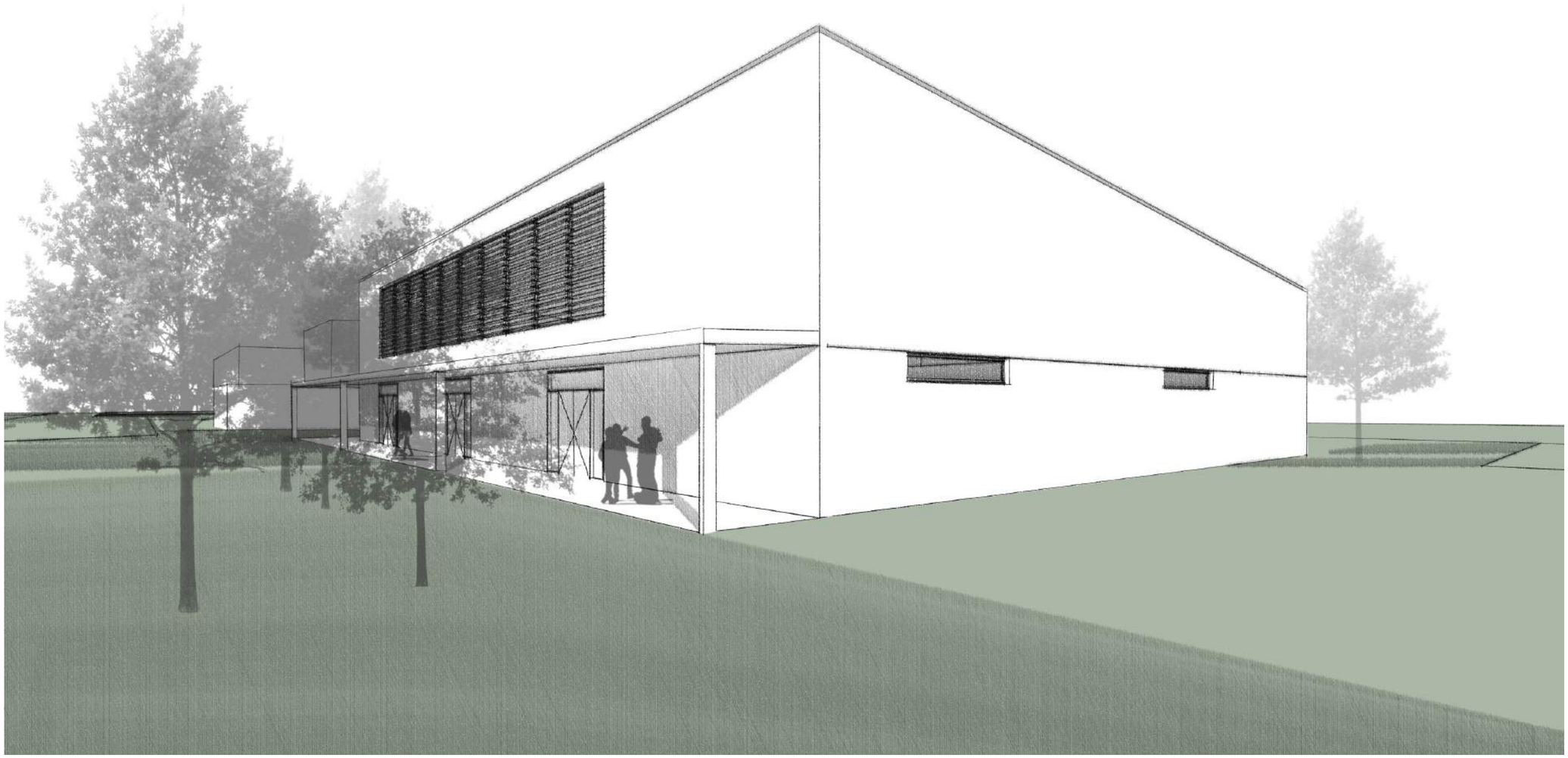
06 Concept Design

Developed Concept Option 4A: Perspective (Preferred option)



03 Concept Design

Developed Concept Option 4A: Perspectives (Preferred option)



03 Concept Design

Developed Concept Option 4A: Perspectives (Preferred option)

06 Concept Design

Developed Concept Option 4A (Preferred option): EFSG Accomodation and Achieved Area Comparison

NSW Department of Education

	NEPEAN CPAHS	EFSG Brief			Achieved Areas			
Option A	**Stream**	**9**			**9**			
	Max. population size	1530			1530			
EFSG Reference	**Space**	Size	No.	Total	Size	No.	Total	**Comments**
HS502	**MOVEMENT COMPLEX**							
HS502.01*	Gymnasium	620	1	620	620	1	620	
HS502.03	Gymnasium - Extension - Type 3	120	0	0	0	0	0	
HS502.04	Movement Studio	160	0	0	0	0	0	
HS502.16	Stage	100	0	0	43	1	43	
HS502.05*	Sport Equipment Store	30	1	30	30	1	30	
HS502.06*	Large Equipment Store	30	1	30	30	1	30	
HS502.07*	Outdoor Equipment Store	25	1	25	25	1	25	
HS502.08*	Chair Store	33	0	0	0	0	0	
HS502.22	Chair Store Room - Type 3	50	1	50	50	1	50	
HS502.10	Movement Studio Store	22	0	0	0	0	0	
HS502.11	Control Room	10	1	10	10	1	10	
HS502.12	First Aid	13	1	13	13	1	13	
HS502.13	Shower	12	3	36	17	2	34	
HS408.03	Change	22	6	132	22	6	132	
HS602.11	Staff Toilet	5	1	5	5	1	5	
HS502.15	Staff Shower	3	1	3	4	1	4	
HS602.12	Access Shower / Toilet	6	1	6	6	1	6	
	Additional circulation around gymnasium				7.7	1	7.7	Result of adding an additional 200mm to the EFSG min 2m clearance around court.
	Foyer				46	1	46	
	SUB-TOTAL INTERNAL			***960***			***1056***	***SUB-TOTAL INTERNAL***
	Building Covered Walkway				120	1	120	
	External Covered Walkway				0	1	0	
	Extended Carpark				0	1	0	
	External Landscape Works				552	1	552	
	Other							
	SUB-TOTAL EXTERNAL						***672***	***SUB-TOTAL EXTERNAL***
	GRAND TOTAL						**1728**	***GRAND TOTAL***

Appendix C

Site Photographs

Photo 1 - Southern portion of site

Photo 2 - Shed in central portion of site

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs	PROJECT: 92407.02
	Metro North Hall Package - Proposed Mutlipurpose Halls1	PLATE No: 1
	Nepean Creative and Performing Arts High School, 115 - 119 Great Western Highway, Emu Plains, NSW	REV: A
	CLIENT: School Infrastructure NSW	DATE: Oct-20

Photo 3 - Building materials and area of elevated fill in western portion of site

Photo 4 - Scrap metal and building materials with LPG tanks beyond

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs	PROJECT: 92407.02
	Metro North Hall Package - Proposed Mutlipurpose Halls1	PLATE No: 2
	Nepean Creative and Performing Arts High School, 115 - 119 Great Western Highway, Emu Plains, NSW	REV: A
	CLIENT: School Infrastructure NSW	DATE: Oct-20

Photo 5 - Skip bin with building materials in northwest portion of site

Photo 6 - LGP ASTs in central northern portion of site

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs	PROJECT: 92407.02
	Metro North Hall Package - Proposed Mutlipurpose Halls1	PLATE No: 3
	Nepean Creative and Performing Arts High School, 115 - 119 Great Western Highway, Emu Plains, NSW	REV: A
	CLIENT: School Infrastructure NSW	DATE: Oct-20

Appendix D

DQOs and SAC

Appendix D - 1 Data Quality Objectives

The DSI has been devised broadly in accordance with the seven step data quality objective (DQO) process which is provided in Appendix B, Schedule B2 of the *National Environment Protection (Assessment of Site Contamination) Measure* 1999 as amended 2013 (NEPC, 2013). The DQO process is outlined as follows:

D1.1 State the Problem

Redevelopment/upgrading works are proposed for the secondary high school presently located at the site which include construction of a proposed multipurpose hall.

A Preliminary Site Assessment (PSI) of the Site completed in May 2020 identified the following potential areas of environmental concern (PAEC) which require further investigation for the Site to be considered suitable for the proposed development:

- PAEC1 - Areas where actual or potential filling has occurred including a raised area of fill in the western portion of the site;
- PAEC2 - A former building historically located in the northern portion of the site and nearby buildings contained asbestos;
- PAEC3 - Potential for contamination of surface soils in the vicinity of the shed within central portion of the site and the LPG ASTs to the north of the shed as the result of fuel/chemical spillages/leakages and storage malpractice; and
- PAEC4 - Historical turf farming and/or market gardening activities. Potential impact to shallow soils across the site.

The “problem” to be addressed is the extent and nature of potential contamination at the site and whether the site is suitable for the proposed development.

The objective of the investigation is as follows:

- Assess the contamination status of the site and the suitability of the site, from a contamination standpoint, for the proposed redevelopment/upgrading works and continued use of the site as a secondary high school.

D1.2 Identify the Decision/Goal of the Study

The suitability of the site for the current and assumed future commercial/industrial development was assessed based on the findings of the site walkover and a comparison of the analytical results for contaminants of potential concern (COPC) with the adopted site assessment criteria (SAC). The adopted SAC are provided in Section D2 below.

Based on the past land use, the main COPC are expected to be total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene and xylenes (BTEX), polycyclic aromatic hydrocarbons (PAH), organochlorine pesticides (OCP), heavy metals and asbestos. Other commonly found contaminants which may be present include phenols, organophosphate pesticides (OPP) and polychlorinated biphenyls (PCB).

The following specific decisions were considered as part of the DSI:

- Did field observation and analytical results identify potential contamination sources (PAEC) which were not included in the CSM?
- Were COPC present in soil at concentrations that pose a potential risk to identified receptors?
- Is the data sufficient to make a decision regarding the abovementioned risks, the suitability of the site for the proposed development?
- Does contamination at the site, if encountered, trigger the Duty to Report requirements under the CLM Act 1997?
- Are there any off-site migration issues that need to be considered?

D1.3 Identify Information Inputs

Inputs into the decisions are as follows:

- Review of regional geology, topography and hydrogeology information;
- Review of site history information;
- Completion of a site inspection;
- Soil samples were collected in the immediate vicinity of identified potential sources of contamination (AEC) across the Site from a total of 13 bore locations;
- The lithology of the Site as described in the bore logs (Appendix E);
- Field and laboratory QA/QC data to assess the suitability of the environmental data for the DSI (Appendix H);
- All analysis was undertaken at a laboratory accredited by the National Association of Testing Authorities (NATA); and
- Laboratory reported concentrations of COPC were compared with the NEPC (2013) criteria as discussed in Section D2.

D1.4 Define the Study Boundaries

The site is located at 115 - 119 Great Western Highway, Emu Plains NSW within the local government area of Penrith City Council. The site covers an approximate total area of 0.47 hectares and is comprised of Part Lot 12 Deposited Plan 1056135.

The site location and boundaries are shown on Drawing 1, Appendix A.

The investigation was undertaken to a maximum depth of 6.0 m below ground level (bgl) across the Site.

Field investigations were undertaken on 19 September 2020 by a DP Environmental Scientist.

D1.5 Develop the Analytical Approach (or Decision Rule)

The information obtained during the assessment was used to characterise the Site in terms of contamination issues and risk to human health and the environment. The decision rules used in characterising the site were as follows:

- The adopted SAC was the NSW Environment Protection Authority (EPA) endorsed criteria; and
- The contaminant concentrations in soil were compared to the adopted SAC to evaluate whether further investigation or remedial action was required.

Field and laboratory test results were considered useable for the assessment after evaluation against the following data quality indicators (DQIs):

- Precision – a measure of variability or reproducibility of data;
- Accuracy – a measure of closeness of the data to the 'true' value;
- Representativeness – the confidence (qualitative) of data representativeness of media present on site;
- Completeness – a measure of the amount of usable data from a data collection activity; and
- Comparability – the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event.

The specific limits are outlined in the data QA/QC procedures and results (Appendix H).

D1.6 Specify the Performance or Acceptable Criteria

Decision errors for the respective COPC for fill and natural soils are:

1. Deciding that fill and natural soil at the Site exceeds the adopted SAC when they truly do not; and
2. Deciding that fill and natural soil at the Site is within the adopted SAC when they truly do not.

Decision errors for the PSI were minimised and measured by the following:

- The sampling regime targeted each stratum identified to account for site variability;
- Sample collection and handling techniques were in accordance with DP's *Field Procedures Manual*;
- Samples were prepared and analysed by a NATA-accredited laboratory with the acceptance limits for laboratory QA/QC parameters based on the laboratory reported acceptance limits and those stated in the NEPC (2013);
- The analyte selection is based on the available site history, past site activities and site features. The potential for contaminants other than those proposed to be analysed is considered to be low; and
- The SAC were adopted from established and NSW EPA endorsed guidelines. The SAC have risk probabilities already incorporated.

D1.7 Optimise the design for obtaining data

Sampling design and procedures that were implemented to optimise data collection for achieving the DQOs included the following;

- A NATA accredited laboratory using NATA endorsed methods were used to perform laboratory analysis;
- Additional soil samples were collected but kept 'on hold' pending details of initial analysis so that they could be analysed if further delineation was required; and
- Adequately experienced environmental scientists/engineers were chosen to conduct field work and sample analysis interpretation.

Appendix D – 2 - Site Assessment Criteria

The SAC applied in the current investigation are informed by the CSM which identified human and environmental receptors to potential contamination on the site (refer to Section 5). Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising investigation and screening levels as per Schedule B1, *National Environment Protection (Assessment of Site Contamination) Measure* 1999, as amended 2013 (NEPC, 2013).

The investigation and screening levels applied in the current investigation comprise levels adopted for a recreational land use scenario with garden/accessible soil which includes secondary high schools.

D2.1 Health Investigation and Screening Levels

The generic Health Investigation Levels (HILs) and Health Screening Levels (HSLs) are considered to be appropriate for the assessment of human health risk associated with contamination at the site. The adopted soil HILs and HSLs for the COPC are presented in Table D2, with inputs into their derivation shown in Table D1.

As shown in Table D2 the adopted HSLs are based on a potential vapour intrusion pathway, as identified in the CSM. Although the CSM also identifies a direct contact pathway as well as construction worker receptors, the corresponding HSLs are significantly higher than those for the vapour intrusion pathway and are therefore not drivers for further assessment and/or remediation. As such the direct contact and intrusive maintenance worker HSLs have not been listed.

Table D1: Inputs to the Derivation of HSLs

Variable	Input	Rationale
Potential exposure pathway	Inhalation of vapours	Potential exposure pathways
Soil Type	Sand and clayey sand	Dominant soil type in surface soils (see Bore Logs – Appendix D)
Depth to contamination	0 m to <1 m	Potential contamination sources likely to impact surface soils

Table D2: HIL and HSL in mg/kg Unless Otherwise Indicated

Contaminants		HIL- C	HSL- C
Metals	Arsenic	300	-
	Cadmium	90	-
	Chromium (VI)	300	-
	Copper	17000	-
	Lead	600	-
	Mercury (inorganic)	80	-
	Nickel	1200	-
	Zinc	30000	-
PAH	Benzo(a)pyrene TEQ[1]	3	-
	Total PAH	300	-
	Naphthalene	-	NL[3]
TRH	F1	-	NL
	F2	-	NL
	F3	-	-
	F4	-	-
BTEX	Benzene	-	NL[3]
	Toluene	-	NL[3]
	Ethylbenzene	-	NL[3]
	Xylenes	-	NL[3]

Contaminants		HIL- C	HSL- C
OCP	Aldrin + Dieldrin	10	-
	Chlordane	70	-
	DDT+DDE+DDD	400	-
	Endosulfan	340	-
	Endrin	20	-
	Heptachlor	10	-
	HCB	10	-
	Methoxychlor	400	-
OPP	Chlorpyrifos	250	-
PCB [2]		1	

Notes:

1 Sum of carcinogenic PAH

2 Non dioxin-like PCBs only.

3 The soil saturation concentration (Csat) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds Csat, a soil vapour source concentration for a petroleum mixture could not exceed a level that would results in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'.

D2.2 Ecological Investigation Levels

Ecological Investigation Levels (EILs) and Added Contaminant Limits (ACLs), where appropriate, have been derived in NEPC (2013) for only a short list of contaminants comprising As, Cu, Cr (III), DDT, naphthalene, Ni, Pb and Zn. The adopted EILs, derived using the *Interactive (Excel) Calculation Spreadsheet* (Standing Council on Environment and Water (SCEW) website (http://www.scew.gov.au/node/941)) are shown in the following Table F4, with inputs into their derivation shown on Table F3.

Table D3: Inputs to the Derivation of EILs

Variable	Input	Rationale
Age of contaminants	"Aged" (>2 years)	Given the potential sources of soil contamination are from historic use, the contamination is considered as "aged" (>2 years);
pH	8.2	3 selected samples were tested for pH. The average pH value has been used as an initial screening.
CEC	9.14 cmolc/kg	5 selected samples were tested for CEC. The average CEC value has been used as an initial screening.
Clay content	10 %	Conservative value for initial screen

Variable	Input	Rationale
Traffic volumes	high	The Site is considered to be located within a high traffic area
State / Territory	New South Wales	-

Table D4: EIL in mg/kg

Analyte		EIL
Metals	Arsenic	100
	Copper	190
	Nickel	140
	Chromium III	410
	Lead	1,100
	Zinc	450
PAH	Naphthalene	170

D2.3 Ecological Screening Levels

Ecological Screening Levels (ESLs) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. The adopted ESLs, based on a fine soil type are shown in the following Table D5.

Table D5: ESL in mg/kg

Analyte		ESL[1]	Comments
TRH	F1	180*	All ESLs are low reliability apart from those marked with * which are moderate reliability
	F2	120*	
	F3	300	
	F4	2,800	
BTEX	Benzene	50	
	Toluene	85	
	Ethylbenzene	70	
	Xylenes	105	
PAH	Benzo(a)pyrene	0.7	

D2.4 Management Limits

In addition to appropriate consideration and application of the HSLs and ESLs, there are additional considerations which reflect the nature and properties of petroleum hydrocarbons, including:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosion hazards; and
- Effects on buried infrastructure e.g. penetration of, or damage to, in-ground services.

The adopted management limits, based on a fine soil type (Section 11.1), are shown in the following Table D6.

Table D6: Management Limits in mg/kg

Analyte		Management Limit
TRH	$C_6 - C_{10}$ (F1) #	700
	$>C_{10}-C_{16}$ (F2) #	1,000
	$>C_{16}-C_{34}$ (F3)	2,500
	$>C_{34}-C_{40}$ (F4)	10 000

Separate management limits for BTEX and naphthalene are not available hence these have not been subtracted from the relevant fractions to obtain F1 and F2

D2.5 Asbestos in Soil

NEPC (2013) defines the various asbestos types as follows:

Bonded ACM: Asbestos containing material which is in sound condition, bound in a matrix of cement or resin, and cannot pass a 7 mm x 7 mm sieve.

FA: Fibrous asbestos material including severely weathered cement sheet, insulation products and woven asbestos material. This material is typically unbonded or was previously bonded and is now significantly degraded and crumbling.

AF: Asbestos fines including free fibres, small fibre bundles and also small fragments of bonded ACM that pass through a 7 mm x 7 mm sieve.

Health Screening Levels (HSLs) for asbestos in soil, which are based on likely exposure levels for different scenarios, have been adopted in NEPC (2013) from the Western Australian Department of Health (WA DoH) publication Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia 2009 (WA DoH 2009).

On the basis of the proposed land use, and in accordance with Table 7, Schedule B1, NEPC (2013) the following asbestos HSLs have been adopted:

Table C6: Health Screening Levels for Asbestos Contamination in Soil (% w/w)

Form of Asbestos	HSL
Bonded ACM	0.02%
FA and AF	0.001 %
All Forms of Asbestos	No visible asbestos for surface soil

Appendix E

Bore and Testpit Logs

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: 25.6 mAHD
EASTING: 284031.6
NORTHING: 6263259.4
DIP/AZIMUTH: 90°/--

BORE No: 1
PROJECT No: 92407.02
DATE: 19/9/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
25.6	0.0	FILL / TOPSOIL: Silty CLAY: brown, trace rootlets, w < PL, surficial vegetation		D/E*	0.0–0.1				
25.4	0.2	Silty CLAY CL: low plasticity, orange-brown, w < PL, stiff to very stiff, alluvial		D/E	0.2–0.3				
24.6	1.0	Bore discontinued at 1.0m		D	0.9–1.0				

RIG: Hanjin DB8 **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased

TYPE OF BORING: 110mm diameter SFA

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *BD2/20200919 sampled at 0-0.1m.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: 25.4 mAHD
EASTING: 284004.5
NORTHING: 6263273.8
DIP/AZIMUTH: 90°/--

BORE No: 2
PROJECT No: 92407.02
DATE: 19/9/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
25	0.2	FILL / TOPSOIL: Clayey SILT: brown, trace rootlets, w < PL, surficial vegetation		D/E*	0.0–0.1				
		Clayey SAND SC: fine to medium, orange-brown, damp, loose to medium dense, alluvial		D/E	0.2–0.3				
24	1			S	1.0–1.45		3,4,4 N = 8		
23	2.5	SAND SP: fine to medium, orange-brown, damp, loose, alluvial		S	2.5–2.95		3,3,4 N = 7		
22	3.5	SAND SW: fine to coarse, orange-brown, with coarse rounded river gravel and trace cobbles up to 80mm diameter, damp, medium dense, alluvial		S	4.0–4.45		4,5,6 N = 11		
21	5	5.0m: becoming brown and grey							
20	5.5	Bore discontinued at 5.5m							
19	6								

RIG: Hanjin DB8 **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased

TYPE OF BORING: 110mm diameter SFA

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *BD3/20200919 sampled at 0-0.1m. Bore collapsed to 4.5m after augering to 5.5m and attempting SPT.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: 25.3 mAHD
EASTING: 283988.2
NORTHING: 6263284
DIP/AZIMUTH: 90°/--

BORE No: 3
PROJECT No: 92407.02
DATE: 19/9/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
25	0.1	FILL / TOPSOIL: Clayey SAND: brown, trace rootlets, damp, surficial vegetation		D/E	0.0				
				D/E	0.1				
		Clayey SAND SC: fine to medium, orange-brown, damp, loose to medium dense, alluvial			0.2				
				D	0.4				
					0.5				
				U50					
					0.8				
				D	0.9				
24	1				1.0				1
				S			3,4,4 N = 8		
				D	1.45				
					1.5				
				D	1.9				
23	2				2.0				2
				D	2.4				
	2.5	SAND SP: medium, orange-brown, dry, medium dense, alluvial			2.5				
				S			3,5,7 N = 12		
				D	2.95				
22	3				3.0				3
				D	3.4				
	3.5	SAND SW: fine to coarse, orange-brown, with coarse rounded river gravel and trace cobbles up to 80mm diameter, damp, medium dense, alluvial			3.5				
				D	3.9				
21	4				4.0				4
				S			5,12,14 N = 26		
					4.45				
20	5	5.0m: becoming brown and grey							5
	5.5	Bore discontinued at 5.5m							
19	6								6

RIG: Hanjin DB8 **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased

TYPE OF BORING: 110mm diameter SFA

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Bore collapsed to 4.0m after augering to 5.5m and attempting SPT

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: 25.4 mAHD
EASTING: 284005.4
NORTHING: 6263291.3
DIP/AZIMUTH: 90°/--

BORE No: 4
PROJECT No: 92407.02
DATE: 19/9/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
25	0.2	TOPSOIL / Silty SAND: fine to medium, brown, trace rootlets, damp, surficial vegetation		D/E	0.0 – 0.1				
		Silty SAND SM: fine to medium, orange-brown, damp, medium dense, alluvial		D/E	0.2 – 0.3				
	0.6	SAND SP: fine to medium, orange-brown, damp, medium dense, alluvial		D/E	0.9 – 1.0				
24	1.0	Bore discontinued at 1.0m							

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20; 1, 2, 3, 4

RIG: Hanjin DB8 **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased

TYPE OF BORING: 110mm diameter SFA

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: 25.5 mAHD
EASTING: 284022.1
NORTHING: 6263276.3
DIP/AZIMUTH: 90°/--

BORE No: 5
PROJECT No: 92407.02
DATE: 19/9/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
25	0.0	FILL / TOPSOIL: Silty CLAY CL: low plasticity, grey-brown, trace sand and gravel, trace rootlets, w < PL, surficial vegetation		D/E	0.0 0.1				
	0.3	Silty CLAY CL: low plasticity, orange-brown, trace sand, w < PL, stiff, alluvial		D	0.3 0.4				
				U50	0.5 0.8				
				D	0.9				
24	1.0	Clayey SAND SC: fine to medium, orange-brown, damp, loose to medium dense, alluvial		S	1.0		3,4,4 N = 8		
				D	1.45 1.5				
				D	1.9				
23	2.0	SAND SP: fine to medium, orange-brown, with clay, moist, medium dense, alluvial		S	2.0 2.5		5,7,9 N = 16		
				D	2.95 3.0				
22	3.5	SAND SW: medium to coarse, orange-brown, with coarse rounded river gravel and trace river cobbles up to 80mm diameter, damp, medium dense, alluvial		S	4.0		3,6,7 N = 13		
21					4.45				
20				S	5.5		4,9,11 N = 20		
19	6.0	Bore discontinued at 6.0m			5.95				

RIG: Hanjin DB8 **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased

TYPE OF BORING: 110mm diameter SFA

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: 25.5 mAHD
EASTING: 284023.4
NORTHING: 6263290.7
DIP/AZIMUTH: 90°/--

BORE No: 6
PROJECT No: 92407.02
DATE: 19/9/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
25	0.05	FILL / ROADBASE: Gravelly SAND: grey, medium to coarse igneous gravel, trace brick fragments, dry		D/E	0.1				
	0.2	Silty SAND SM: fine to medium, brown, dry, very dense, alluvial		D/E	0.2				
		Clayey SAND SC: fine to medium, orange-brown, dry, dense, alluvial			0.3				
24	1.0	SAND SP: fine to medium, orange-brown, damp, medium dense, alluvial		S	1.0		4,5,6 N = 11		
					1.45				
23				S	2.5		4,6,7 N = 13		
		3.0m: becoming dry			2.95				
22	3.5	SAND SW: medium to coarse, pale grey-brown, with coarse, rounded, river gravel and trace river cobbles up to 80mm diameter, dry, dense, alluvial		S	4.0		13,15,16 N = 31		
					4.45				
20	5.5	Bore discontinued at 5.5m							
19									

RIG: Hanjin DB8 **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased

TYPE OF BORING: 110mm diameter SFA

WATER OBSERVATIONS: No free groundwater observed

REMARKS: Bore collapsed to 4.0m after augering to 5.5m and attempting SPT.

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: 26.5 mAHD
EASTING: 284008.6
NORTHING: 6263314.2
DIP/AZIMUTH: 90°/--

BORE No: 7
PROJECT No: 92407.02
DATE: 19/9/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
26.5	0.0	FILL / TOPSOIL: Clayey SILT: brown, with organic matter, trace sand, w < PL		D/E	0.0				
					0.1				
26.3	0.2	Silty SAND SM: fine to medium, pale brown, damp, dense, alluvial		D/E	0.2				
					0.3				
26.0	0.5	SAND SP: fine to medium, orange-brown, trace clay, damp, medium dense, alluvial							
				D/E	0.9				
25.5	1				1.0				1
				S			9,9,9 N = 18		
				D	1.45				
					1.5				
				U50					
					1.8				
				D	1.9				
25.0	2				2.0				2
				D	2.4				
					2.5				
				S			5,6,7 N = 13		
				D	2.95				
24.0	3	3.0m: becoming pale brown			3.0				3
23.5	3.5	SAND SW: medium to coarse, pale brown, trace coarse rounded river gravel, dry, medium dense, alluvial							
					4.0				
				S			8,8,5 N = 13		
					4.45				
22.0	4								4
					5.5				
				S			3,5,8 N = 13		
					5.95				
20.5	6.0	Bore discontinued at 6.0m							6

RIG: Hanjin DB8 **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased

TYPE OF BORING: 110mm diameter SFA

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: 28.4 mAHD
EASTING: 284021.5
NORTHING: 6263312.3
DIP/AZIMUTH: 90°/--

BORE No: 8
PROJECT No: 92407.02
DATE: 19/9/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
28.4	0.0	FILL / Gravelly CLAY: brown, with sand, trace organic material, w < PL		D/E	0.0 - 0.1				
28.2	0.2	Clayey SAND SC: fine to medium, orange-brown, damp, dense, alluvial		D/E	0.2 - 0.3				
27.4	1.0	Bore discontinued at 1.0m		D/E	0.9 - 1.0				

RIG: Hanjin DB8 **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased
TYPE OF BORING: 110mm diameter SFA
WATER OBSERVATIONS: No free groundwater observed
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: 25.6 mAHD
EASTING: 284040.1
NORTHING: 6263292.8
DIP/AZIMUTH: 90°/--

BORE No: 9
PROJECT No: 92407.02
DATE: 19/9/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
25	0.0	FILL / Clayey SAND: fine to medium, brown, damp		D/E	0.0 - 0.1				
	0.2	Clayey SAND SC: fine to medium, orange-brown, damp, medium dense, alluvial		D/E	0.3 - 0.4				
	0.7	SAND SP: fine to medium, orange-brown, damp, medium dense, alluvial		D/E	0.9				
	1.0	Bore discontinued at 1.0m			1.0				

RIG: Hanjin DB8 **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased
TYPE OF BORING: 110mm diameter SFA
WATER OBSERVATIONS: No free groundwater observed
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: 25.6 mAHD
EASTING: 284021.8
NORTHING: 6263331.4
DIP/AZIMUTH: 90°/--

BORE No: 10
PROJECT No: 92407.02
DATE: 19/9/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
25	0.0	FILL / ROADBASE: Sandy GRAVEL: grey, igneous gravel, dry		D/E	0.0 - 0.1				
	0.2	Sandy SILT OL: low plasticity, pale brown, w < PL, stiff , alluvial		D/E	0.2 - 0.3				
	0.5	Clayey SAND SC: fine to medium, orange-brown, dry, medium dense, alluvial		D/E	0.9 - 1.0				
	1			D	1.4 - 1.5				1
	1.5	Bore discontinued at 1.5m							
24	2								2
23	3								3
22	4								4
21									

RIG: Hanjin DB8 **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased
TYPE OF BORING: 110mm diameter SFA
WATER OBSERVATIONS: No free groundwater observed
REMARKS: *BD1/20200919 sampled at 0-0.1m

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: 25.7 mAHD
EASTING: 284044.1
NORTHING: 6263329.3
DIP/AZIMUTH: 90°/--

BORE No: 11
PROJECT No: 92407.02
DATE: 19/9/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
25	0.0	FILL / ROADBASE: Sandy GRAVEL: pale grey, igneous gravel, dry		D/E	0.0 - 0.1				
				D/E	0.3				
	0.4	SAND SP: fine to medium, brown, trace clay, damp, medium dense, alluvial		D/E	0.4 - 0.5				
		0.6m: becoming orange-brown							
				D/E	0.9				
	1.0	Bore discontinued at 1.0m			1.0				

RIG: Hanjin DB8 **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased
TYPE OF BORING: 110mm diameter SFA
WATER OBSERVATIONS: No free groundwater observed
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: 25.5 mAHD
EASTING: 284043.5
NORTHING: 6263307.4
DIP/AZIMUTH: 90°/--

BORE No: 12
PROJECT No: 92407.02
DATE: 19/9/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
25	0.05	FILL / ROADBASE: Sandy GRAVEL: grey, igneous gravel, damp		D/E	0.05				
		FILL / Silty SAND: fine to medium, brown, with gravel, moist, appears generally well compacted			0.1				
				D/E	0.3				
	0.4	Clayey SAND SC: fine to medium, orange-brown, damp, very dense, alluvial		D/E	0.4				
					0.5				
	0.9	SAND SP: fine to medium, brown, moist, dense, alluvial		D/E	0.9				
24	1				1.0				1
		1.2m: becoming orange-brown							
				D/E	1.4				
					1.5				
23	2								2
				D	2.4				
	2.5	Bore discontinued at 2.5m			2.5				
22	3								3
21	4								4

RIG: Hanjin DB8 **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased

TYPE OF BORING: 110mm diameter SFA

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: 25.8 mAHD
EASTING: 284054.3
NORTHING: 6263280.5
DIP/AZIMUTH: 90°/--

BORE No: 13
PROJECT No: 92407.02
DATE: 19/9/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per 150mm)
25	0.1	FILL / TOPSOIL: Silty SAND: brown, with clay, trace rootlets, dry, surficial vegetation		D/E	0.0				
		FILL / Silty SAND: fine to medium, brown, dry			0.1				
	0.3	Clayey SAND SC: fine to medium, orange-brown, damp, medium dense, alluvial		D/E	0.3				
					0.4				
				D/E	0.9				
	1.0	Bore discontinued at 1.0m			1.0				

RIG: Hanjin DB8 **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased

TYPE OF BORING: 110mm diameter SFA

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 101
PROJECT No: 92407.02
DATE: 24/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		ASPHALTIC CONCRETE		D	0.0		B (0-0.4m)		
					0.05				
	0.15	FILL / SAND: fine grained, brown, trace clay and gravel, dry		B	0.2				
				D					
					0.3				
	0.4	Pit discontinued at 0.4m			0.4				
	1								1

Dynamic Penetrometer Test (blows per mm): 5, 10, 15, 20

RIG: Hand Tools (cro-bar, shovel)

LOGGED: JY

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 102
PROJECT No: 92407.02
DATE: 24/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
		ASPHALTIC CONCRETE		D/B	0.0				
	0.15	FILL / SAND: fine grained, brown, trace clay and gravel, dry							
	0.2	Pit discontinued at 0.2m			0.2				
	1								1

RIG: Hand Tools (cro-bar, shovel)

LOGGED: JY

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 103
PROJECT No: 92407.02
DATE: 24/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
		FILL / Clayey SAND: grey, trace gravel, damp		D/B	0.0				
	0.3	Pit discontinued at 0.3m			0.3				
	1								1

RIG: Hand Tools (cro-bar, shovel)

LOGGED: JY

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 104
PROJECT No: 92407.02
DATE: 24/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
		FILL / SAND: grey-brown, with gravel, trace clay, trace rootlets, dry, surficial vegetation		D/B	0.0				
	0.2	Clayey SAND: fine to medium, orange-brown, damp, dense, alluvial			0.2				
	0.3	Pit discontinued at 0.3m							
	1								1

RIG: Hand Tools (cro-bar, shovel)

LOGGED: JY

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 105
PROJECT No: 92407.02
DATE: 24/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
		ASPHALTIC CONCRETE			0.0				
	0.15	FILL / SAND: brown, with gravel, dry		D/B					
	0.25	Pit discontinued at 0.25m			0.25				
	1								1

RIG: Hand Tools (cro-bar, shovel)

LOGGED: JY

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 106
PROJECT No: 92407.02
DATE: 24/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
		ASPHALTIC CONCRETE		D/B	0.0				
	0.2	FILL / SAND: fine to medium grained, pale brown, with gravel, dry							
	0.3	Pit discontinued at 0.3m			0.3				
	1								1

RIG: Hand Tools (cro-bar, shovel)
LOGGED: JY
SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 107
PROJECT No: 92407.02
DATE: 24/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
		ASPHALTIC CONCRETE		D	0.0				
	0.1	Pit discontinued at 0.1m - Practical refusal			0.1				
	1								1

RIG: Hand Tools (cro-bar, shovel)

LOGGED: JY

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 108
PROJECT No: 92407.02
DATE: 24/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
		ASPHALTIC CONCRETE		D	0.0				
	0.05	Pit discontinued at 0.05m - Practical refusal			0.05				
	1								1

RIG: Hand Tools (cro-bar, shovel)
LOGGED: JY
SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 109
PROJECT No: 92407.02
DATE: 24/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
		ORGANIC MATERIAL - mulch, bark, rootlets, trace sand, clay and gravel		D/B	0.0				
	0.3	Pit discontinued at 0.3m - Limit of investigation			0.3				
	1								1

RIG: Hand Tools (cro-bar, shovel)

LOGGED: JY

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	⧗	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 110
PROJECT No: 92407.02
DATE: 24/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
		ASPHALTIC CONCRETE		D	0.0				
	0.05	Pit discontinued at 0.05m			0.05				
	1								1

RIG: Hand Tools (cro-bar, shovel)

LOGGED: JY

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 111
PROJECT No: 92407.02
DATE: 24/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
		ASPHALTIC CONCRETE		D	0.0				
	0.05	Pit discontinued at 0.05m			0.05				
	1								1

RIG: Hand Tools (cro-bar, shovel)

LOGGED: JY

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 112
PROJECT No: 92407.02
DATE: 24/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
		ASPHALTIC CONCRETE		D	0.0				
	0.1	Pit discontinued at 0.1m			0.1				
	1								1

RIG: Hand Tools (cro-bar, shovel)

LOGGED: JY

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 113
PROJECT No: 92407.02
DATE: 24/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
		ORGANIC MATERIAL - mulch, bark, rootlets, trace sand, clay and gravel		D/B	0.0				
	0.4	Pit discontinued at 0.4m			0.4				
	1								1

RIG: Hand Tools (cro-bar, shovel)

LOGGED: JY

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 114
PROJECT No: 92407.02
DATE: 24/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
		FILL / Silty SAND: fine to medium grained, brown, trace clay, gravel and rootlets, moist, surficial vegetation		D/B	0.0				
	0.2	Pit discontinued at 0.2m			0.2				
	1								1

RIG: Hand Tools (cro-bar, shovel)
LOGGED: JY
SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: School Infrastructure NSW
PROJECT: Nepean CAPA HS - Multi-Purpose Hall
LOCATION: 115-119 Great Western Highway, Emu Plains

SURFACE LEVEL: --
EASTING:
NORTHING:

PIT No: 115
PROJECT No: 92407.02
DATE: 24/10/2020
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm) 5 10 15 20
		FILL / Sandy GRAVEL: brown, with silt and clay, trace rootlets, w < PL, surficial vegetation		D/B	0.0				
	0.1	Pit discontinued at 0.01m			0.1				
	1								1

RIG: Hand Tools (cro-bar, shovel)

LOGGED: JY

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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Sampling Methods

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Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm 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 150 mm of, say, 4, 6 and 7 as:

  4,6,7
  N=13

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

  15, 30/40 mm

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

Soil Descriptions

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Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are based on Australian Standard AS 1726-1993, Geotechnical Site Investigations Code. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	20 - 63
Medium gravel	6 - 20
Fine gravel	2.36 - 6
Coarse sand	0.6 - 2.36
Medium sand	0.2 - 0.6
Fine sand	0.075 - 0.2

The proportions of secondary constituents of soils are described as:

Term	Proportion	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	20 - 35%	Sandy Clay
Slightly	12 - 20%	Slightly Sandy Clay
With some	5 - 12%	Clay with some sand
With a trace of	0 - 5%	Clay with a trace of sand

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	vs	<12
Soft	s	12 - 25
Firm	f	25 - 50
Stiff	st	50 - 100
Very stiff	vst	100 - 200
Hard	h	>200

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	SPT N value	CPT qc value (MPa)
Very loose	vl	<4	<2
Loose	l	4 - 10	2 -5
Medium dense	md	10 - 30	5 - 15
Dense	d	30 - 50	15 - 25
Very dense	vd	>50	>25

Soil Descriptions

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Transported soils - formed somewhere else and transported by nature to the site; or
- Filling - moved by man.

Transported soils may be further subdivided into:

- Alluvium - river deposits
- Lacustrine - lake deposits
- Aeolian - wind deposits
- Littoral - beach deposits
- Estuarine - tidal river deposits
- Talus - scree or coarse colluvium
- Slopewash or Colluvium - transported downslope by gravity assisted by water. Often includes angular rock fragments and boulders.

Symbols & Abbreviations

Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U_{50}	Undisturbed tube sample (50mm)
W	Water sample
pp	Pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	Lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

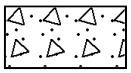
Symbols & Abbreviations

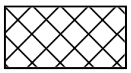
Graphic Symbols for Soil and Rock

General

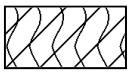

Asphalt

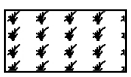

Road base

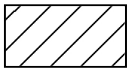

Concrete

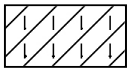

Filling

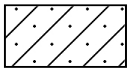
Soils


Topsoil

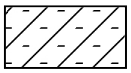

Peat

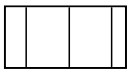

Clay

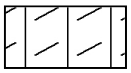

Silty clay

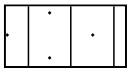

Sandy clay

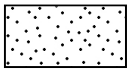

Gravelly clay

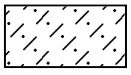

Shaly clay

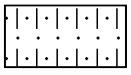

Silt


Clayey silt


Sandy silt

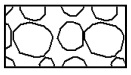

Sand

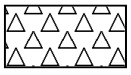

Clayey sand


Silty sand


Gravel

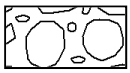

Sandy gravel


Cobbles, boulders

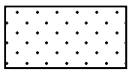

Talus

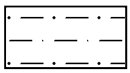
Sedimentary Rocks

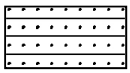

Boulder conglomerate

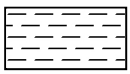

Conglomerate


Conglomeratic sandstone

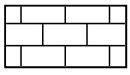

Sandstone


Siltstone

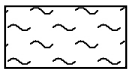

Laminite

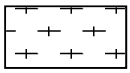

Mudstone, claystone, shale

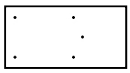

Coal


Limestone

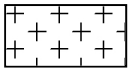
Metamorphic Rocks

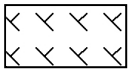

Slate, phyllite, schist

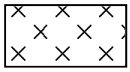

Gneiss

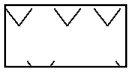

Quartzite

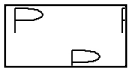
Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

Appendix F

Summary Table F1 to F3

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Table 1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH

			Metals								TRH						BTEX				PAH			
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs
		PQL	4	0.4	1	1	1	0.1	1	1	25	50	25	50	100	100	0.2	0.5	1	1	1	0.05	0.5	0.05
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
1	0 - 0.1 m	19/09/2020	<4	<0.4	11	9	15	<0.1	8	37	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
2	0 - 0.1 m	19/09/2020	<4	<0.4	9	8	18	<0.1	7	38	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
3	0 - 0.1 m	19/09/2020	<4	<0.4	7	5	12	<0.1	4	19	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
3	0.1 - 0.2 m	19/09/2020	<4	<0.4	12	7	13	<0.1	6	22	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
4	0 - 0.1 m	19/09/2020	<4	<0.4	8	6	8	<0.1	6	17	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
5	0 - 0.1 m	19/09/2020	<4	<0.4	8	6	11	<0.1	5	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
6	0.1 - 0.2 m	19/09/2020	<4	<0.4	7	6	12	<0.1	5	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
6	0.2 - 0.3 m	19/09/2020	<4	<0.4	12	7	9	<0.1	7	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
7	0 - 0.1 m	19/09/2020	<4	<0.4	2	17	4	<0.1	3	88	<25	150	<25	150	1300	700	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
8	0 - 0.1 m	19/09/2020	<4	<0.4	7	15	10	<0.1	7	32	<25	<50	<25	<50	240	120	<0.2	<0.5	<1	<1	<1	0.1	<0.5	0.69
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
9	0 - 0.1 m	19/09/2020	<4	<0.4	8	13	17	0.2	7	62	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
9	0.3 - 0.4 m	19/09/2020	<4	<0.4	9	5	8	<0.1	5	14	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
10	0 - 0.1 m	19/09/2020	<4	<0.4	10	13	13	<0.1	7	32	<25	<50	<25	<50	120	<100	<0.2	<0.5	<1	<1	<1	0.4	<0.5	4.1
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
11	0 - 0.1 m	19/09/2020	<4	<0.4	10	19	18	<0.1	9	34	<25	<50	<25	<50	150	160	<0.2	<0.5	<1	<1	<1	0.8	1.2	8.5
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
12	0.05 - 0.1 m	19/09/2020	<4	<0.4	15	20	17	<0.1	29	67	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	0.06	<0.5	0.3
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
13	0 - 0.1 m	19/09/2020	<4	<0.4	10	14	16	<0.1	10	130	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
BD2	0 m	19/09/2020	<4	<0.4	11	9	15	<0.1	7	30	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	NT	NT	NT
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
TS	0 m	19/09/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	107	116	89	181	NT	NT	NT	NT
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
TB	0 m	19/09/2020	NT	NT	NT	NT	NT	NT	NT	NT	<25	NT	<25	NT	NT	NT	<0.2	<0.5	<1	<1	<1	NT	NT	NT
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC
11 - [TRIPLICATE]	0 - 0.1 m	19/09/2020	<4	<0.4	12	25	16	<0.1	10	39	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
			300 100	90 NC	300 410	#### 190	600 1100	80 NC	1200 140	#### 450	NC NC	NC NC	NL 180	NL 120	NC 300	NC 2800	NL 50	NL 85	NL 70	NL 105	NL 170	NC 0.7	3 NC	300 NC

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance | EIL/ESL exceedance | HIL/HSL and EIL/ESL exceedance | ML exceedance | ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab below the PQL, refer to the lab report **Blue** = DC exceedance

Bold = Lab detections NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable NAD = No asbestos detected

Notes:

HIL/HSL/DC	NEPC, Schedule B1 - HIL C (undefined), HSL C (undefined), DC HSL C (undefined)
EIL/ESL	NEPC, Schedule B1 - EIL UR/POS (undefined), ESL UR/POS (undefined)
ML	NEPC, Schedule B1 - ML R/P/POS (undefined)
a	QA/QC replicate of sample listed directly below the primary sample
b	reported naphthalene laboratory result obtained from BTEXN suite
c	criteria applies to DDT only

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Table 2: Summary of Laboratory Results – Phenol, OCP, OPP, PCB, Asbestos (50g)

			Phenol	OCP												OPP	PCB	Asbestos		
			Phenol	DDT+DDE+DDDc	DDD	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyriphos	Total PCB	Asbestos ID in soil >0.1g/kg	Trace Analysis	Asbestos (50 g)
		PQL	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	-
1	0 - 0.1 m	19/09/2020	<5 120 NC	<0.1 400 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 10 NC	<0.1 70 NC	<0.1 340 NC	<0.1 20 NC	<0.1 10 NC	<0.1 10 NC	<0.1 400 NC	<0.1 250 NC	<0.1 1 NC	NAD	NAD	NAD
2	0 - 0.1 m	19/09/2020	<5 120 NC	<0.1 400 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 10 NC	<0.1 70 NC	<0.1 340 NC	<0.1 20 NC	<0.1 10 NC	<0.1 10 NC	<0.1 400 NC	<0.1 250 NC	<0.1 1 NC	NAD	NAD	NAD
3	0 - 0.1 m	19/09/2020	<5 120 NC	<0.1 400 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 10 NC	<0.1 70 NC	<0.1 340 NC	<0.1 20 NC	<0.1 10 NC	<0.1 10 NC	<0.1 400 NC	<0.1 250 NC	<0.1 1 NC	NAD	NAD	NAD
3	0.1 - 0.2 m	19/09/2020	NT 120 NC	NT 400 180	NT NC NC	NT NC NC	NT NC 180	NT 10 NC	NT 70 NC	NT 340 NC	NT 20 NC	NT 10 NC	NT 10 NC	NT 400 NC	NT 250 NC	NT 1 NC	NT	NT	NT
4	0 - 0.1 m	19/09/2020	<5 120 NC	<0.1 400 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 10 NC	<0.1 70 NC	<0.1 340 NC	<0.1 20 NC	<0.1 10 NC	<0.1 10 NC	<0.1 400 NC	<0.1 250 NC	<0.1 1 NC	NAD	NAD	NAD
5	0 - 0.1 m	19/09/2020	<5 120 NC	<0.1 400 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 10 NC	<0.1 70 NC	<0.1 340 NC	<0.1 20 NC	<0.1 10 NC	<0.1 10 NC	<0.1 400 NC	<0.1 250 NC	<0.1 1 NC	NAD	NAD	NAD
6	0.1 - 0.2 m	19/09/2020	<5 120 NC	<0.1 400 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 10 NC	<0.1 70 NC	<0.1 340 NC	<0.1 20 NC	<0.1 10 NC	<0.1 10 NC	<0.1 400 NC	<0.1 250 NC	<0.1 1 NC	NAD	NAD	NAD
6	0.2 - 0.3 m	19/09/2020	NT 120 NC	NT 400 180	NT NC NC	NT NC NC	NT NC 180	NT 10 NC	NT 70 NC	NT 340 NC	NT 20 NC	NT 10 NC	NT 10 NC	NT 400 NC	NT 250 NC	NT 1 NC	NT	NT	NT
7	0 - 0.1 m	19/09/2020	<5 120 NC	<0.1 400 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 10 NC	<0.1 70 NC	<0.1 340 NC	<0.1 20 NC	<0.1 10 NC	<0.1 10 NC	<0.1 400 NC	<0.1 250 NC	<0.1 1 NC	NAD	NAD	NAD
8	0 - 0.1 m	19/09/2020	<5 120 NC	<0.1 400 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 10 NC	<0.1 70 NC	<0.1 340 NC	<0.1 20 NC	<0.1 10 NC	<0.1 10 NC	<0.1 400 NC	<0.1 250 NC	<0.1 1 NC	NAD	NAD	NAD
9	0 - 0.1 m	19/09/2020	<5 120 NC	<0.1 400 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 10 NC	<0.1 70 NC	<0.1 340 NC	<0.1 20 NC	<0.1 10 NC	<0.1 10 NC	<0.1 400 NC	<0.1 250 NC	<0.1 1 NC	NAD	NAD	NAD
9	0.3 - 0.4 m	19/09/2020	NT 120 NC	NT 400 180	NT NC NC	NT NC NC	NT NC 180	NT 10 NC	NT 70 NC	NT 340 NC	NT 20 NC	NT 10 NC	NT 10 NC	NT 400 NC	NT 250 NC	NT 1 NC	NT	NT	NT
10	0 - 0.1 m	19/09/2020	<5 120 NC	<0.1 400 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 10 NC	<0.1 70 NC	<0.1 340 NC	<0.1 20 NC	<0.1 10 NC	<0.1 10 NC	<0.1 400 NC	<0.1 250 NC	<0.1 1 NC	NAD	NAD	NAD
11	0 - 0.1 m	19/09/2020	<5 120 NC	<0.1 400 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 10 NC	<0.1 70 NC	<0.1 340 NC	<0.1 20 NC	<0.1 10 NC	<0.1 10 NC	<0.1 400 NC	<0.1 250 NC	<0.1 1 NC	NAD	NAD	NAD
12	0.05 - 0.1 m	19/09/2020	<5 120 NC	<0.1 400 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 10 NC	<0.1 70 NC	<0.1 340 NC	<0.1 20 NC	<0.1 10 NC	<0.1 10 NC	<0.1 400 NC	<0.1 250 NC	<0.1 1 NC	NAD**	NAD	NAD
13	0 - 0.1 m	19/09/2020	<5 120 NC	<0.1 400 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 10 NC	<0.1 70 NC	<0.1 340 NC	<0.1 20 NC	<0.1 10 NC	<0.1 10 NC	<0.1 400 NC	<0.1 250 NC	<0.1 1 NC	NAD	NAD	NAD
BD2	0 m	19/09/2020	NT 120 NC	NT 400 180	NT NC NC	NT NC NC	NT NC 180	NT 10 NC	NT 70 NC	NT 340 NC	NT 20 NC	NT 10 NC	NT 10 NC	NT 400 NC	NT 250 NC	NT 1 NC	NT	NT	NT
TS	0 m	19/09/2020	NT 120 NC	NT 400 180	NT NC NC	NT NC NC	NT NC 180	NT 10 NC	NT 70 NC	NT 340 NC	NT 20 NC	NT 10 NC	NT 10 NC	NT 400 NC	NT 250 NC	NT 1 NC	NT	NT	NT
TB	0 m	19/09/2020	NT 120 NC	NT 400 180	NT NC NC	NT NC NC	NT NC 180	NT 10 NC	NT 70 NC	NT 340 NC	NT 20 NC	NT 10 NC	NT 10 NC	NT 400 NC	NT 250 NC	NT 1 NC	NT	NT	NT
11 - [TRIPLICATE]	0 - 0.1 m	19/09/2020	NT 120 NC	NT 400 180	NT NC NC	NT NC NC	NT NC 180	NT 10 NC	NT 70 NC	NT 340 NC	NT 20 NC	NT 10 NC	NT 10 NC	NT 400 NC	NT 250 NC	NT 1 NC	NT	NT	NT

Lab result
HIL/HSL value EIL/ESL value

HIL/HSL exceedance | EIL/ESL exceedance | HIL/HSL and EIL/ESL exceedance | ML exceedance | ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab below the PQL, refer to the lab report **Blue** = DC exceedance

Bold = Lab detections NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable NAD = No asbestos detected

Notes:

HIL/HSL/DC	NEPC, Schedule B1 - HIL C (undefined), HSL C (undefined), DC HSL C (undefined)
EIL/ESL	NEPC, Schedule B1 - EIL UR/POS (undefined), ESL UR/POS (undefined)
ML	NEPC, Schedule B1 - ML R/P/POS (undefined)
a	QA/QC replicate of sample listed directly below the primary sample
b	reported naphthalene laboratory result obtained from BTEXN suite
c	criteria applies to DDT only
**	Chrysotile asbestos identified embedded in a fragment of fibre cement, it is estimated to be 0.07 g/kg in 51.20g of soil (<reporting limit for the method 0f 0.1g/kg)

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Table F3 - Summary of Bulk Soil Sampling and Analytical Results

Sample Number	Weight of 10 Litre Bulk Sample (g)	Number of fragments > 7mm	Condition of Fragments (good/poor)	Size range of Fragment (mm)	Weight of Screened ACM (g)	Concentration of asbestos in ACM in soil (% w/w)*	Weight of 500mL Sample (g)	Weight of AF or FA (g)**	Concentration of FA and AF in soil (% w/w)
HSL C for Asbestos in soil	-	-	-	-	-	0.020	-	-	0.001
TP101/0-0.05	-	-	-	-	-	-	1599.7	-	<0.001
TP101/0.2-0.3	-	-	-	-	-	-	1476.57	-	<0.001
TP101/0.0-0.4	15500	-	-	-	-	-	-	-	<0.001
TP102/0.0-0.2	16000	-	-	-	-	-	1711.9	-	<0.001
TP103/0.0-0.3	14000	-	-	-	-	-	925.45	-	<0.001
TP104/0.0-0.2	15000	-	-	-	-	-	1373.41	-	<0.001
TP105/0.0-0.25	15000	-	-	-	-	-	1422.47	-	<0.001
TP106/0.0-0.3	16000	-	-	-	-	-	1639.2	-	<0.001
TP107/0.0-0.1	-	-	-	-	-	-	1472.97	-	<0.001
TP108/0.0-0.05	-	-	-	-	-	-	1634.4	-	<0.001
TP109/0.0-0.3	8000	-	-	-	-	-	199.43	-	<0.001
TP110/0.0-0.05	-	-	-	-	-	-	1612.3	-	<0.001
TP111/0.0-0.05	-	-	-	-	-	-	1572.7	-	<0.001
TP112/0.0-0.1	-	-	-	-	-	-	1527.3	-	<0.001
TP113/0.0-0.4	8000	-	-	-	-	-	144.46	-	<0.001
TP114/0.0-0.2	15000	-	-	-	-	-	1274.66	-	<0.001
TP115/0.0-0.1	14000	-	-	-	-	-	1487.71	-	<0.001

HSL C for Asbestos in soil	Table 7 of Schedule B(1), NEPC (2013) for recreational land use scenario
*	Based on % w/w asbestos in soil assuming 15% asbestos in ACM
**	Based on the weight of asbestos in FA and AF as calculated by Envirolab. Values exclude calculated weight of bonded ACM greater than > 7mm in samples
-	Not applicable as no asbestos was detected
Bold	Concentration exceeds SAC

Appendix G

Lab Certificates of Analysis and Chain-of-Custody documentation

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 251837

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Gavin Boyd
Address	18 Waler Crescent, Smeaton Grange, NSW, 2567

Sample Details

Your Reference	**92407.02, Emu Plains**
Number of Samples	32 SOIL
Date samples received	22/09/2020
Date completed instructions received	22/09/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

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

Report Details

Date results requested by	29/09/2020
Date of Issue	29/09/2020

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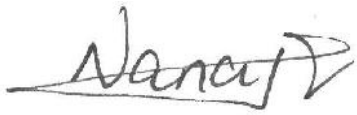
Asbestos Approved By
Analysed by Asbestos Approved Identifier: Panika Wongchanda
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Jaimie Loa-Kum-Cheung, Metals Supervisor
Lucy Zhu, Asbestos Supervisor
Manju Dewendrage, Chemist
Priya Samarawickrama, Senior Chemist
Steven Luong, Organics Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		251837-1	251837-2	251837-3	251837-4	251837-10
Your Reference	UNITS	1	2	3	3	4
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.1-0.2	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
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	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	95	91	98	95	86

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		251837-11	251837-12	251837-13	251837-17	251837-18
Your Reference	UNITS	5	6	6	7	8
Depth		0.0-0.1	0.1-0.2	0.2-0.3	0.0-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
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	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	87	91	93	94	95

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		251837-19	251837-20	251837-21	251837-22	251837-23
Your Reference	UNITS	9	9	10	11	12
Depth		0.0-0.1	0.3-0.4	0.0-0.1	0.0-0.1	0.05-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
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	<3	<3	<3	<3	<3
Surrogate aaa-Trifluorotoluene	%	91	97	90	88	96

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		251837-28	251837-30	251837-31	251837-32
Your Reference	UNITS	13	BD2	TS	TB
Depth		0.0-0.1	-	-	-
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020
TRH C_6 - C_9	mg/kg	<25	<25	[NA]	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	[NA]	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	[NA]	<25
Benzene	mg/kg	<0.2	<0.2	107%	<0.2
Toluene	mg/kg	<0.5	<0.5	116%	<0.5
Ethylbenzene	mg/kg	<1	<1	89%	<1
m+p-xylene	mg/kg	<2	<2	89%	<2
o-Xylene	mg/kg	<1	<1	92%	<1
naphthalene	mg/kg	<1	<1	[NA]	<1
Total +ve Xylenes	mg/kg	<3	<3	[NA]	<3
Surrogate aaa-Trifluorotoluene	%	97	93	99	89

svTRH (C10-C40) in Soil						
Our Reference		251837-1	251837-2	251837-3	251837-4	251837-10
Your Reference	UNITS	1	2	3	3	4
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.1-0.2	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	25/09/2020	25/09/2020	25/09/2020	25/09/2020	25/09/2020
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	%	78	80	86	78	76

svTRH (C10-C40) in Soil						
Our Reference		251837-11	251837-12	251837-13	251837-17	251837-18
Your Reference	UNITS	5	6	6	7	8
Depth		0.0-0.1	0.1-0.2	0.2-0.3	0.0-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	25/09/2020	25/09/2020	25/09/2020	25/09/2020	25/09/2020
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	99	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	520	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	1,200	210
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	150	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	150	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	1,300	240
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	700	120
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	2,100	360
Surrogate o-Terphenyl	%	76	76	76	121	88

svTRH (C10-C40) in Soil						
Our Reference		251837-19	251837-20	251837-21	251837-22	251837-23
Your Reference	UNITS	9	9	10	11	12
Depth		0.0-0.1	0.3-0.4	0.0-0.1	0.0-0.1	0.05-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	25/09/2020	25/09/2020	25/09/2020	25/09/2020	25/09/2020
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	110	150	<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	120	150	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	160	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	120	320	<50
Surrogate o-Terphenyl	%	75	77	80	79	79

svTRH (C10-C40) in Soil			
Our Reference		251837-28	251837-30
Your Reference	UNITS	13	BD2
Depth		0.0-0.1	-
Date Sampled		19/09/2020	19/09/2020
Type of sample		SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020
Date analysed	-	25/09/2020	25/09/2020
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50
Surrogate o-Terphenyl	%	79	77

PAHs in Soil						
Our Reference		251837-1	251837-2	251837-3	251837-4	251837-10
Your Reference	UNITS	1	2	3	3	4
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.1-0.2	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
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	<0.05	<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	<0.05	<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	%	102	98	95	94	103

PAHs in Soil						
Our Reference		251837-11	251837-12	251837-13	251837-17	251837-18
Your Reference	UNITS	5	6	6	7	8
Depth		0.0-0.1	0.1-0.2	0.2-0.3	0.0-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
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	0.2
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
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	<0.05	<0.05	<0.05	<0.05	0.1
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	<0.05	<0.05	<0.05	<0.05	0.69
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	%	94	101	103	114	96

PAHs in Soil						
Our Reference		251837-19	251837-20	251837-21	251837-22	251837-23
Your Reference	UNITS	9	9	10	11	12
Depth		0.0-0.1	0.3-0.4	0.0-0.1	0.0-0.1	0.05-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
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	0.4	0.8	<0.1
Anthracene	mg/kg	<0.1	<0.1	0.1	0.2	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.8	1.6	0.1
Pyrene	mg/kg	<0.1	<0.1	0.8	1.5	0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.4	0.7	<0.1
Chrysene	mg/kg	<0.1	<0.1	0.3	0.7	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	0.6	1	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.4	0.80	0.06
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	0.2	0.4	<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	0.2	0.4	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	4.1	8.5	0.3
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	1.2	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	0.5	1.2	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	0.6	1.2	<0.5
Surrogate p-Terphenyl-d14	%	98	98	101	96	100

PAHs in Soil		
Our Reference		251837-28
Your Reference	UNITS	13
Depth		0.0-0.1
Date Sampled		19/09/2020
Type of sample		SOIL
Date extracted	-	24/09/2020
Date analysed	-	24/09/2020
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate p-Terphenyl-d14	%	94

Organochlorine Pesticides in soil						
Our Reference		251837-1	251837-2	251837-3	251837-10	251837-11
Your Reference	UNITS	1	2	3	4	5
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	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
gamma-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
Endosulfan II	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
Endrin Aldehyde	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
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	%	104	100	98	97	95

Organochlorine Pesticides in soil						
Our Reference		251837-12	251837-17	251837-18	251837-19	251837-21
Your Reference	UNITS	6	7	8	9	10
Depth		0.1-0.2	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	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
gamma-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
Endosulfan II	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
Endrin Aldehyde	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
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	%	100	110	102	99	101

Organochlorine Pesticides in soil				
Our Reference		251837-22	251837-23	251837-28
Your Reference	UNITS	11	12	13
Depth		0.0-0.1	0.05-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	101	101	100

Organophosphorus Pesticides in Soil						
Our Reference		251837-1	251837-2	251837-3	251837-10	251837-11
Your Reference	UNITS	1	2	3	4	5
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
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
Diazinon	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
Ronnel	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
Chlorpyriphos	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
Bromophos-ethyl	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
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	104	100	98	97	95

Organophosphorus Pesticides in Soil						
Our Reference		251837-12	251837-17	251837-18	251837-19	251837-21
Your Reference	UNITS	6	7	8	9	10
Depth		0.1-0.2	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
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
Diazinon	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
Ronnel	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
Chlorpyriphos	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
Bromophos-ethyl	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
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	100	110	102	99	101

Organophosphorus Pesticides in Soil				
Our Reference		251837-22	251837-23	251837-28
Your Reference	UNITS	11	12	13
Depth		0.0-0.1	0.05-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	101	101	100

PCBs in Soil						
Our Reference		251837-1	251837-2	251837-3	251837-10	251837-11
Your Reference	UNITS	1	2	3	4	5
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
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 TCMX	%	104	100	98	97	95

PCBs in Soil						
Our Reference		251837-12	251837-17	251837-18	251837-19	251837-21
Your Reference	UNITS	6	7	8	9	10
Depth		0.1-0.2	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
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 TCMX	%	100	110	102	99	101

PCBs in Soil				
Our Reference		251837-22	251837-23	251837-28
Your Reference	UNITS	11	12	13
Depth		0.0-0.1	0.05-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL
Date extracted	-	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	101	101	100

Acid Extractable metals in soil						
Our Reference		251837-1	251837-2	251837-3	251837-4	251837-10
Your Reference	UNITS	1	2	3	3	4
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.1-0.2	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	11	9	7	12	8
Copper	mg/kg	9	8	5	7	6
Lead	mg/kg	15	18	12	13	8
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	8	7	4	6	6
Zinc	mg/kg	37	38	19	22	17

Acid Extractable metals in soil						
Our Reference		251837-11	251837-12	251837-13	251837-17	251837-18
Your Reference	UNITS	5	6	6	7	8
Depth		0.0-0.1	0.1-0.2	0.2-0.3	0.0-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	8	7	12	2	7
Copper	mg/kg	6	6	7	17	15
Lead	mg/kg	11	12	9	4	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	5	7	3	7
Zinc	mg/kg	21	21	21	88	32

Acid Extractable metals in soil						
Our Reference		251837-19	251837-20	251837-21	251837-22	251837-23
Your Reference	UNITS	9	9	10	11	12
Depth		0.0-0.1	0.3-0.4	0.0-0.1	0.0-0.1	0.05-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	8	9	10	10	15
Copper	mg/kg	13	5	13	19	20
Lead	mg/kg	17	8	13	18	17
Mercury	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	7	5	7	9	29
Zinc	mg/kg	62	14	32	34	67

Acid Extractable metals in soil				
Our Reference		251837-28	251837-30	251837-33
Your Reference	UNITS	13	BD2	11 - [TRIPLICATE]
Depth		0.0-0.1	-	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL
Date prepared	-	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020
Arsenic	mg/kg	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4
Chromium	mg/kg	10	11	12
Copper	mg/kg	14	9	25
Lead	mg/kg	16	15	16
Mercury	mg/kg	<0.1	<0.1	<0.1
Nickel	mg/kg	10	7	10
Zinc	mg/kg	130	30	39

Misc Soil - Inorg						
Our Reference		251837-1	251837-2	251837-3	251837-10	251837-11
Your Reference	UNITS	1	2	3	4	5
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference		251837-12	251837-17	251837-18	251837-19	251837-21
Your Reference	UNITS	6	7	8	9	10
Depth		0.1-0.2	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg				
Our Reference		251837-22	251837-23	251837-28
Your Reference	UNITS	11	12	13
Depth		0.0-0.1	0.05-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL
Date prepared	-	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5

Moisture						
Our Reference		251837-1	251837-2	251837-3	251837-4	251837-10
Your Reference	UNITS	1	2	3	3	4
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.1-0.2	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	25/09/2020	25/09/2020	25/09/2020	25/09/2020	25/09/2020
Moisture	%	12	12	11	39	11

Moisture						
Our Reference		251837-11	251837-12	251837-13	251837-17	251837-18
Your Reference	UNITS	5	6	6	7	8
Depth		0.0-0.1	0.1-0.2	0.2-0.3	0.0-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	25/09/2020	25/09/2020	25/09/2020	25/09/2020	25/09/2020
Moisture	%	13	8.1	11	47	13

Moisture						
Our Reference		251837-19	251837-20	251837-21	251837-22	251837-23
Your Reference	UNITS	9	9	10	11	12
Depth		0.0-0.1	0.3-0.4	0.0-0.1	0.0-0.1	0.05-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	25/09/2020	25/09/2020	25/09/2020	25/09/2020	25/09/2020
Moisture	%	9.8	15	8.7	5.6	9.9

Moisture			
Our Reference		251837-28	251837-30
Your Reference	UNITS	13	BD2
Depth		0.0-0.1	-
Date Sampled		19/09/2020	19/09/2020
Type of sample		SOIL	SOIL
Date prepared	-	24/09/2020	24/09/2020
Date analysed	-	25/09/2020	25/09/2020
Moisture	%	13	13

Asbestos ID - soils						
Our Reference		251837-1	251837-2	251837-3	251837-10	251837-11
Your Reference	UNITS	1	2	3	4	5
Depth		0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Sample mass tested	g	Approx. 35g	Approx. 35g	Approx. 35g	Approx. 45g	Approx. 50g
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		251837-12	251837-17	251837-18	251837-19	251837-21
Your Reference	UNITS	6	7	8	9	10
Depth		0.1-0.2	0.0-0.1	0.0-0.1	0.0-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Sample mass tested	g	Approx. 35g	Approx. 15g	Approx. 50g	Approx. 50g	Approx. 60g
Sample Description	-	Brown coarse-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-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		251837-22	251837-23	251837-28
Your Reference	UNITS	11	12	13
Depth		0.0-0.1	0.05-0.1	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL
Date analysed	-	24/09/2020	24/09/2020	24/09/2020
Sample mass tested	g	Approx. 60g	51.20g	Approx. 35g
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

Misc Inorg - Soil						
Our Reference		251837-3	251837-8	251837-14	251837-21	251837-24
Your Reference	UNITS	3	3	6	10	12
Depth		0.0-0.1	1.45-1.5	1.0-1.45	0.0-0.1	0.4-0.5
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	23/09/2020	23/09/2020	23/09/2020	23/09/2020	23/09/2020
Date analysed	-	23/09/2020	23/09/2020	23/09/2020	23/09/2020	23/09/2020
pH 1:5 soil:water	pH Units	6.2	[NA]	[NA]	10.7	[NA]
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	10	<10	[NA]	20
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	26	<10	[NA]	53

Misc Inorg - Soil		
Our Reference		251837-28
Your Reference	UNITS	13
Depth		0.0-0.1
Date Sampled		19/09/2020
Type of sample		SOIL
Date prepared	-	23/09/2020
Date analysed	-	23/09/2020
pH 1:5 soil:water	pH Units	7.7

ESP/CEC						
Our Reference		251837-3	251837-5	251837-21	251837-24	251837-28
Your Reference	UNITS	3	3	10	12	13
Depth		0.0-0.1	0.4-0.5	0.0-0.1	0.4-0.5	0.0-0.1
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Date analysed	-	24/09/2020	24/09/2020	24/09/2020	24/09/2020	24/09/2020
Exchangeable Ca	meq/100g	1.9	1.7	21	4.2	9.3
Exchangeable K	meq/100g	0.2	0.1	0.9	<0.1	0.1
Exchangeable Mg	meq/100g	0.74	1.5	0.31	1.9	1.2
Exchangeable Na	meq/100g	<0.1	<0.1	0.22	<0.1	<0.1
Cation Exchange Capacity	meq/100g	3.0	3.5	22	6.2	11
ESP	%	[NT]	[NT]	<1	[NT]	<1

Texture and Salinity*						
Our Reference		251837-5	251837-6	251837-8	251837-9	251837-13
Your Reference	UNITS	3	3	3	3	6
Depth		0.4-0.5	0.9-1.0	1.45-1.5	1.9-2.0	0.2-0.3
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	25/09/2020	25/09/2020	23/09/2020	25/09/2020	25/09/2020
Date analysed	-	25/09/2020	25/09/2020	23/09/2020	25/09/2020	25/09/2020
Electrical Conductivity 1:5 soil:water	µS/cm	38	26	37	39	19
Texture Value	-	9.0	9.0	8.0	8.0	9.0
Texture	-	CLAY LOAM	CLAY LOAM	LIGHT MEDIUM CLAY	LIGHT MEDIUM CLAY	CLAY LOAM
ECe	dS/m	<2	<2	<2	<2	<2
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*						
Our Reference		251837-14	251837-15	251837-16	251837-24	251837-25
Your Reference	UNITS	6	6	6	12	12
Depth		1.0-1.45	2.5-2.95	4.0-4.45	0.4-0.5	0.9-1.0
Date Sampled		19/09/2020	19/09/2020	19/09/2020	19/09/2020	19/09/2020
Type of sample		SOIL	SOIL	SOIL	SOIL	SOIL
Date prepared	-	23/09/2020	25/09/2020	25/09/2020	23/09/2020	25/09/2020
Date analysed	-	23/09/2020	25/09/2020	25/09/2020	23/09/2020	25/09/2020
Electrical Conductivity 1:5 soil:water	µS/cm	21	28	10	86	66
Texture Value	-	8.0	9.0	14	9.0	9.0
Texture	-	LIGHT MEDIUM CLAY	CLAY LOAM	SANDY LOAM	CLAY LOAM	CLAY LOAM
ECe	dS/m	<2	<2	<2	<2	<2
Class	-	NON SALINE	NON SALINE	NON SALINE	NON SALINE	NON SALINE

Texture and Salinity*			
Our Reference		251837-26	251837-27
Your Reference	UNITS	12	12
Depth		1.4-1.5	2.4-2.5
Date Sampled		19/09/2020	19/09/2020
Type of sample		SOIL	SOIL
Date prepared	-	25/09/2020	25/09/2020
Date analysed	-	25/09/2020	25/09/2020
Electrical Conductivity 1:5 soil:water	µS/cm	220	82
Texture Value	-	9.0	14
Texture	-	CLAY LOAM	SANDY LOAM
ECe	dS/m	<2	<2
Class	-	NON SALINE	NON SALINE

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-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-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
INORG-123	Determined using a "Texture by Feel" method.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-AES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	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-020	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-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	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.

Method ID	Methodology Summary
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. 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-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/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-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	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-023	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-2	251837-2
Date extracted	-			24/09/2020	1	24/09/2020	24/09/2020		24/09/2020	24/09/2020
Date analysed	-			24/09/2020	1	24/09/2020	24/09/2020		24/09/2020	24/09/2020
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	87	86
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	87	86
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	89	89
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	87	84
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	81	80
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	90	89
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	90	89
naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	112	1	95	101	6	98	100

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	24/09/2020	24/09/2020		[NT]	[NT]
Date analysed	-			[NT]	22	24/09/2020	24/09/2020		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	22	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	22	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	22	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	22	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	22	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	22	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	22	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-023	[NT]	22	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	22	88	96	9	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	251837-2
Date extracted	-			24/09/2020	1	24/09/2020	24/09/2020		24/09/2020	24/09/2020
Date analysed	-			25/09/2020	1	25/09/2020	25/09/2020		25/09/2020	25/09/2020
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	91	129
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	99	102
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	104	#
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	91	129
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	99	102
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	104	#
Surrogate o-Terphenyl	%		Org-020	77	1	78	77	1	84	80

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	24/09/2020	24/09/2020		[NT]	[NT]
Date analysed	-			[NT]	22	25/09/2020	25/09/2020		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	22	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	22	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	22	150	150	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	22	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	22	150	140	7	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	22	160	150	6	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	22	79	85	7	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	251837-2
Date extracted	-			24/09/2020	1	24/09/2020	24/09/2020		24/09/2020	24/09/2020
Date analysed	-			24/09/2020	1	24/09/2020	24/09/2020		24/09/2020	24/09/2020
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	95
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	101	98
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	98
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	95
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	105	102
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	107	98
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	131	120
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	<0.05	<0.05	0	107	97
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	100	1	102	101	1	99	96

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	24/09/2020	24/09/2020		[NT]	[NT]
Date analysed	-			[NT]	22	24/09/2020	24/09/2020		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	22	0.1	0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	22	0.8	0.4	67	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	22	0.2	0.1	67	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	22	1.6	1.0	46	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	22	1.5	1.1	31	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	22	0.7	0.5	33	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	22	0.7	0.5	33	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	22	1	1	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	22	0.80	0.61	27	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	22	0.4	0.3	29	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	22	0.1	0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	22	0.4	0.3	29	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	22	96	104	8	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	251837-2
Date extracted	-			24/09/2020	1	24/09/2020	24/09/2020		24/09/2020	24/09/2020
Date analysed	-			24/09/2020	1	24/09/2020	24/09/2020		24/09/2020	24/09/2020
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	83	94
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	91	89
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	81	93
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	94
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	105	92
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	101	99
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	105	123
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	73	75
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	83	86
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	91	112
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	105	1	104	100	4	99	95

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	24/09/2020	24/09/2020		[NT]	[NT]
Date analysed	-			[NT]	22	24/09/2020	24/09/2020		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	22	101	100	1	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	251837-2
Date extracted	-			24/09/2020	1	24/09/2020	24/09/2020		24/09/2020	24/09/2020
Date analysed	-			24/09/2020	1	24/09/2020	24/09/2020		24/09/2020	24/09/2020
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	75	81
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	93
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	83	71
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	98
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	93
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	76	80
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	105	119
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	105	1	104	100	4	99	95

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	24/09/2020	24/09/2020		[NT]	[NT]
Date analysed	-			[NT]	22	24/09/2020	24/09/2020		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	22	101	100	1	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	251837-2
Date extracted	-			24/09/2020	1	24/09/2020	24/09/2020		24/09/2020	24/09/2020
Date analysed	-			24/09/2020	1	24/09/2020	24/09/2020		24/09/2020	24/09/2020
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	80	82
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	105	1	104	100	4	99	95

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	22	24/09/2020	24/09/2020		[NT]	[NT]
Date analysed	-			[NT]	22	24/09/2020	24/09/2020		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	22	101	100	1	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	251837-2
Date prepared	-			24/09/2020	1	24/09/2020	24/09/2020		24/09/2020	24/09/2020
Date analysed	-			24/09/2020	1	24/09/2020	24/09/2020		24/09/2020	24/09/2020
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	103	83
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	100	76
Chromium	mg/kg	1	Metals-020	<1	1	11	10	10	104	83
Copper	mg/kg	1	Metals-020	<1	1	9	8	12	107	97
Lead	mg/kg	1	Metals-020	<1	1	15	13	14	104	82
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	101	78
Nickel	mg/kg	1	Metals-020	<1	1	8	7	13	106	84
Zinc	mg/kg	1	Metals-020	<1	1	37	33	11	107	81

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	22	24/09/2020	24/09/2020		[NT]	[NT]
Date analysed	-			[NT]	22	24/09/2020	24/09/2020		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	22	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	22	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	22	10	10	0	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	22	19	17	11	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	22	18	12	40	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	22	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	22	9	8	12	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	22	34	33	3	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-2	251837-2
Date prepared	-			24/09/2020	1	24/09/2020	24/09/2020		24/09/2020	24/09/2020
Date analysed	-			24/09/2020	1	24/09/2020	24/09/2020		24/09/2020	24/09/2020
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	104	116

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	22	24/09/2020	24/09/2020		[NT]	[NT]
Date analysed	-			[NT]	22	24/09/2020	24/09/2020		[NT]	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	[NT]	22	<5	<5	0	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			23/09/2020	3	23/09/2020	23/09/2020		23/09/2020	[NT]
Date analysed	-			23/09/2020	3	23/09/2020	23/09/2020		23/09/2020	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	3	6.2	6.2	0	101	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	[NT]	[NT]	[NT]	[NT]	106	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	[NT]	[NT]	[NT]	[NT]	108	[NT]

QUALITY CONTROL: ESP/CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			24/09/2020	[NT]	[NT]	[NT]	[NT]	24/09/2020	[NT]
Date analysed	-			24/09/2020	[NT]	[NT]	[NT]	[NT]	24/09/2020	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]

QUALITY CONTROL: Texture and Salinity*						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			23/09/2020	5	25/09/2020	25/09/2020		23/09/2020	[NT]
Date analysed	-			23/09/2020	5	25/09/2020	25/09/2020		23/09/2020	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	5	38	36	5	101	[NT]
Texture Value	-		INORG-123	[NT]	5	9.0	9.0	0	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

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

Sample 251837-23; Chrysotile asbestos identified embedded in a fragment of fibre cement, it is estimated to be 0.07g/kg in 51.20g of soil (i.e. < reporting limit for the method of 0.1g/kg).

ESP: Where the exchangeable Sodium is less than the PQL and CEC is less than 10meq/100g, the ESP cannot be calculated.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 251837-22 for Pb. Therefore a triplicate result has been issued as laboratory sample number 251837-33.

PAHs in Soil - The RPD for duplicate results is accepted due to the non homogenous nature of sample/s XXXXXX-YY.

Andrew (Fitzy) Fitzsimons

From: Aileen Hie
Sent: Tuesday, 3 November 2020 4:07 PM
To: Andrew (Fitzy) Fitzsimons
Subject: FW: Results for Registration 251837 92407.02, Emu Plains

Follow Up Flag: Follow up
Flag Status: Flagged

251837 - A

From: Grant Russell <Grant.Russell@douglaspartners.com.au>
Sent: Tuesday, 3 November 2020 3:57 PM
To: Ken Nguyen <KNguyen@envirolab.com.au>
Cc: Login <Login@envirolab.com.au>; Nancy Zhang <NZhang@envirolab.com.au>; Aileen Hie <AHie@envirolab.com.au>
Subject: RE: Results for Registration 251837 92407.02, Emu Plains

Hi Ken,
Can I get silica gel cleanup for TRH (F2 and F3) completed on sample BH7/0.0-0.1 (lab ID 17).
Can I get this on a 1 day turn around time too?
Regards
Grant

Grant Russell | Associate / Senior Environmental Scientist
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
18 Waler Crescent Smeaton Grange NSW 2567
P: 02 4647 0075 | M: 0418 116 545 | E: Grant.Russell@douglaspartners.com.au

From: Ken Nguyen <KNguyen@envirolab.com.au>
Sent: Tuesday, 29 September 2020 4:38 PM
To: Gavin Boyd <Gavin.Boyd@douglaspartners.com.au>; Grant Russell <Grant.Russell@douglaspartners.com.au>
Subject: Results for Registration 251837 92407.02, Emu Plains

Please refer to attached for:
a copy of the Certificate of Analysis
a copy of the COC/paperwork received from you
ESDAT Extracts
an Excel or .csv file containing the results

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 251837-A

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Grant Russell
Address	18 Waler Crescent, Smeaton Grange, NSW, 2567

Sample Details

Your Reference	**92407.02, Emu Plains**
Number of Samples	32 SOIL
Date samples received	22/09/2020
Date completed instructions received	03/11/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

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

Report Details

Date results requested by	04/11/2020
Date of Issue	04/11/2020

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Results Approved By
Josh Williams, Senior Chemist

Authorised By

Nancy Zhang, Laboratory Manager

sTPH in Soil (C10-C40)-Silica		
Our Reference		251837-A-17
Your Reference	UNITS	7
Depth		0.0-0.1
Date Sampled		19/09/2020
Type of sample		SOIL
Date extracted	-	04/11/2020
Date analysed	-	04/11/2020
TPH C_{10} - C_{14}	mg/kg	<50
TPH C_{15} - C_{28}	mg/kg	<100
TPH C_{29} - C_{36}	mg/kg	<100
TPH >C_{10} -C_{16}	mg/kg	<50
TPH >C_{16} -C_{34}	mg/kg	<100
TPH >C_{34} -C_{40}	mg/kg	<100
Surrogate o-Terphenyl	%	94

Method ID	Methodology Summary
Org-020	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.

QUALITY CONTROL: sTPH in Soil (C10-C40)-Silica						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			04/11/2020	17	04/11/2020	04/11/2020		04/11/2020	[NT]
Date analysed	-			04/11/2020	17	04/11/2020	04/11/2020		04/11/2020	[NT]
TPH C_{10} - C_{14}	mg/kg	50	Org-020	<50	17	<50	<50	0	83	[NT]
TPH C_{15} - C_{28}	mg/kg	100	Org-020	<100	17	<100	<100	0	72	[NT]
TPH C_{29} - C_{36}	mg/kg	100	Org-020	<100	17	<100	<100	0	78	[NT]
TPH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	17	<50	<50	0	83	[NT]
TPH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	17	<100	<100	0	72	[NT]
TPH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	17	<100	<100	0	78	[NT]
Surrogate o-Terphenyl	%		Org-020	125	17	94	98	4	125	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Out of recommended holding time

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	92407.02	**Suburb:**	EMU PLAINS	**To:**	ENVIROLAB
Project Name:	Nepean CAPA HS - Multi-Purpose Hall	**Order Number**			12 Ashley Street Chatswood NSW 2067
Project Manager:	Gavin Boyd	**Sampler:**		**Attn:**	Customer Service
Emails:	gavin.boyd@douglaspartners.com.au kristine.nicodemus@douglaspartners.com.au			**Phone:**	02 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☐			**Email:**	customerservice@envirolab.com.au
Prior Storage:	☐ Esky ☐ Fridge ☐ Shelved	Do samples contain 'potential' HBM?	Yes ☐ No ☐	(If YES, then handle, transport and store in accordance with FPM HAZID)	

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Heavy Metals	Chlorinated Hydrocarbons / OCP/OPP Suite	TRH and BTEX	ECe PAH (natural)	Sodicity + Total Phenols	Asbestos 500 ml	Combo 8a	Combo 3	CEC + pH (natural)	Notes/preservation
1 / 0.0-0.1	1	19.9.20	S	G/P							✓			
1 / 0.2-0.3	NR			G/P										not sent
1 / 0.9-1.0	NR			P										not sent
2 / 0.0-0.1	2			G/P							✓			
2 / 0.2-0.3	NR			G/P										not sent
2 / 1.-1.45	NR			P										not sent
2 / 2.5-2.95	NR			P										not sent
2 / 4.-4.45	NR			P										not sent
3 / 0.0-0.1	3			G/P							✓		✓	
3 / 0.1-0.2	4			G/P								✓		
3 / 0.4-0.5	5			P				✓	✓					
3 / 0.8-0.9	6			P				✓						
3 / 1.0-1.45	7			P		✓								
3 / 1.45-1.5	8			P		✓		✓	✓					emerson crumb
3 / 1.9-2.0	9			P				✓						
PQL (S) mg/kg				P										**ANZECC PQLs req'd for all water analytes** ☐

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

Job No: 251887
Date Received: 22/09/2020
Time Received: 14:40
Received By: RLC
Temp: Cool/Ambient
Cooling: Icepack
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No:

Total number of samples in container: **Relinquished by:** **Transported to laboratory by:**

Send Results to: Douglas Partners Pty Ltd **Address:** **Phone:** **Fax:**

Signed: **Received by:** R.Lhazeen **Date & Time:** 22/09/2020 14.40

12.1.

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	92407.02	**Suburb:**	EMU PLAINS	**To:**	ENVIROLAB
Project Name:	Nepean CAPA HS - Multi-Purpose Hall	**Order Number**			12 Ashley Street Chatswood NSW 2067
Project Manager:	Gavin Boyd	**Sampler:**		**Attn:**	Customer Service
Emails:	gavin.boyd@douglaspartners.com.au kristine.nicodemus@douglaspartners.com.au			**Phone:**	02 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☐			**Email:**	customerservice@envirolab.com.au
Prior Storage:	☐ Esky ☐ Fridge ☐ Shelved	Do samples contain 'potential' HBM?	Yes ☐ No ☐	(If YES, then handle, transport and store in accordance with FPM HAZID)	

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Heavy Metals	OCP/OPP PCB	TRH and BTEX	~~ECE~~ Textura	~~Solvents~~ Total Phenols	Asbestos 500 ml	Combo 8a	Combo 3	CEC + pH	Notes/preservation
3 | 2.4-2.5	NR	19.9.20	S	P										not sent
3 | 2.5-2.95	NR			P										not sent
3 | 2.95-3.0	NR			P										not sent
3 | 3.4-3.5	NR			P										not sent
3 | 3.9-4.0	NR			P										not sent
3 | 4.0-4.45	NR			P										not sent
4 | 0.0-0.1	10			G/P							✓			
4 | 0.2-0.3	NR			G/P										not sent
4 | 0.9-1.0	NR			G/P										not sent (NS)
5 | 0.0-0.1	11			G/P							✓			
5 | 0.3-0.4	NR			P								~~CEC~~		NS
5 | 0.9-1.0	NR			P										
5 | 1.0-1.45	NR			P										
5 | 1.45-1.5	NR			P										
5 | 1.9-2.0	NR			P										
PQL (S) mg/kg				P										

ANZECC PQLs req'd for all water analytes ☐

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Lab Report/Reference No: 251837

Metals to Analyse: 8HM unless specified here:

Total number of samples in container: **Relinquished by:** **Transported to laboratory by:**

Send Results to: Douglas Partners Pty Ltd **Address:** **Phone:** **Fax:**

Signed: **Received by:** **Date & Time:** 22/09/2020. 14.40.

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	92407.02	**Suburb:**	EMU PLAINS	**To:**	ENVIROLAB
Project Name:	Nepean CAPA HS - Multi-Purpose Hall	**Order Number**			12 Ashley Street Chatswood NSW 2067
Project Manager:	Gavin Boyd	**Sampler:**		**Attn:**	Customer Service
Emails:	gavin.boyd@douglaspartners.com.au	kristine.nicodemus@douglaspartners.com.au		**Phone:**	02 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☐			**Email:**	customerservice@envirolab.com.au
Prior Storage:	☐ Esky ☐ Fridge ☐ Shelved	Do samples contain 'potential' HBM? Yes ☐	No ☐	(If YES, then handle, transport and store in accordance with FPM HAZID)	

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Analytes: Heavy Metals	Chlorinated Organics / PCB / Suite A	TRH and BTEX	ECE + PAH + Texture	Total Phenols / Soil Suite A	Asbestos 500 ml	Combo 8a	Combo 3		Notes/preservation
5 / 2.5-2.95	NR	19.9.20	S	P										NS
5 / 2.95-3.0	NR			P										
5 / 4.0-4.45	NR			P										
5 / 5.5-5.95	NR			P										
6 / 0.1-0.2	12			G/P							✓			
6 / 0.2-0.3	13			G/P				✓				✓		
6 / 1.0-1.45	14			P		✓		✓						
6 / 2.5-2.95	15			P				✓						
6 / 4.0-4.45	16			P				✓						
7 / 0.0-0.1	17			G/P							✓			
7 / 0.2-0.3	NR			G/P										NS
7 / 0.9-1.0	NR			P										
7 / 1.45-1.5	NR			P										
7 / 1.9-2.0	NR			P										
7 / 2.4-2.5	NR			P										
PQL (S) mg/kg														

ANZECC PQLs req'd for all water analytes ☐

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Lab Report/Reference No: 251837

Metals to Analyse: 8HM unless specified here:

Total number of samples in container: | **Relinquished by:** | **Transported to laboratory by:**

Send Results to: Douglas Partners Pty Ltd | **Address:** | **Phone:** | **Fax:**

Signed: | **Received by:** | **Date & Time:** 22/09/2020 14:40

Douglas Partners
Geotechnics / Environment / Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	92407.02	**Suburb:**	EMU PLAINS	**To:**	ENVIROLAB
Project Name:	Nepean CAPA HS - Multi-Purpose Hall	**Order Number**			12 Ashley Street Chatswood NSW 2067
Project Manager:	Gavin Boyd	**Sampler:**		**Attn:**	Customer Service
Emails:	gavin.boyd@douglaspartners.com.au kristine.nicodemus@douglaspartners.com.au			**Phone:**	02 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☐			**Email:**	customerservice@envirolab.com.au
Prior Storage:	☐ Esky ☐ Fridge ☐ Shelved	Do samples contain 'potential' HBM?	Yes ☐ No ☐	(If YES, then handle, transport and store in accordance with FPM HAZID)	

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil W - water)	Container Type (G - glass P - plastic)	Analytes: Heavy Metals	OCP/OPP PCB	TRH and BTEX	~~ECE~~ PAH/Texture	~~Total Phenols~~ Soil C.Y	Asbestos 500 ml	Combo 8a	Combo 3	CEC-7 pH	Notes/preservation
7 / 2.95-3.0	NR	19.9.20	S	P										NS
7 / 4.0-4.45	NR	"	"	P										↓
7 / 5.5-5.95	NR			P										
8 / 0.0-0.1	18			G/P							✓			
8 / 0.2-0.3	NR			G/P										NS
8 / 0.9-1.0	NR			G/P										↓
9 / 0.0-0.1	19			G/P							✓			
9 / 0.3-0.4	20			G/P								✓		
9 / 0.9-1.0	NR			G/P										
10 / 0.0-0.1	21			G/P							✓		✓	
10 / 0.2-0.3	NR			G/P										NS
10 / 0.9-1.0	NR			G/P										↓
10 / 1.4-1.5	NR			G/P										
11 / 0.0-0.1	22			G/P							✓			
11 / 0.3-0.4	NR	↓	↓	G/P										NS
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 251837

Total number of samples in container:	**Relinquished by:**	**Transported to laboratory by:**
Send Results to: Douglas Partners Pty Ltd	**Address:**	**Phone:** **Fax:**
Signed:	**Received by:**	**Date & Time:** 22/09/2020. 14.40.

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	92407.02	**Suburb:**	EMU PLAINS	**To:**	ENVIROLAB
Project Name:	Nepean CAPA HS - Multi-Purpose Hall	**Order Number**			12 Ashley Street Chatswood NSW 2067
Project Manager:	Gavin Boyd	**Sampler:**		**Attn:**	Customer Service
Emails:	gavin.boyd@douglaspartners.com.au		kristine.nicodemus@douglaspartners.com.au	**Phone:**	02 9910 6200
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☐			**Email:**	customerservice@envirolab.com.au
Prior Storage:	☐ Esky ☐ Fridge ☐ Shelved	Do samples contain 'potential' HBM? Yes ☐ No ☐ (If YES, then handle, transport and store in accordance with FPM HAZID)			

Sample ID	Lab ID	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Heavy Metals	~~OCP/OPP~~ Chloride ~~PCB~~ Sulphate	TRH and BTEX	~~PAH~~ ec + extract	~~Total Phenols~~ Soil ...	Asbestos 500 ml	Combo 8a	Combo 3	CEC + pH	Notes/preservation
11/0.4-0.5	NR	19.9.20	S	G/P										NS
11/0.9-1.0	NR	↓	↓	G/P										↓
12/0.05-0.1	23			G/P							✓			
12/0.3-0.4	NR			G/P										
12/0.4-0.5	24			G/P		✓		✓	✓					emerson crumb
12/0.9-1.0	25			G/P				✓						
12/1.4-1.5	26			G/P				✓						
12/2.4-2.5	27			- P				✓						
13/0.0-0.1	28			G/P							✓		✓	
13/0.3-0.4	NR			G/P										NS
13/0.9-1.0	NR			G/P										↓
BD1	29			G										hold
BD2	30	↓		G	✓		✓							PAHs - sub sample and send to ALS
TS	31	18/9					✓							
TB	32	18/9	↓				✓							
PQL (S) mg/kg											ANZECC PQLs req'd for all water analytes ☐			

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Lab Report/Reference No: 251837

Metals to Analyse: 8HM unless specified here:

Total number of samples in container: **Relinquished by:** **Transported to laboratory by:**

Send Results to: Douglas Partners Pty Ltd **Address:** **Phone:** **Fax:**

Signed: [signature] **Received by:** [signature] **Date & Time:** 22/09/2020 14:10

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 254288

Client Details

Client	Douglas Partners Pty Ltd Smeaton Grange
Attention	Gavin Boyd
Address	18 Waler Crescent, Smeaton Grange, NSW, 2567

Sample Details

Your Reference	**92407.02, Emu Plains**
Number of Samples	16 soil
Date samples received	26/10/2020
Date completed instructions received	26/10/2020

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

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

Report Details

Date results requested by	02/11/2020
Date of Issue	29/10/2020

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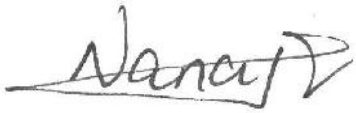
Asbestos Approved By
Analysed by Asbestos Approved Identifier: Nyovan Moonean
Authorised by Asbestos Approved Signatory: Lucy Zhu
Results Approved By
Lucy Zhu, Asbestos Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

Asbestos ID - soils NEPM						
Our Reference		254288-1	254288-2	254288-3	254288-4	254288-5
Your Reference	UNITS	TP101	TP101	TP102	TP103	TP104
Depth		0-0.05	0.2-0.3	0-0.2	0-0.3	0-0.2
Date Sampled		24/10/2020	24/10/2020	24/10/2020	24/10/2020	24/10/2020
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	29/10/2020	29/10/2020	29/10/2020	29/10/2020	29/10/2020
Sample mass tested	g	1,599.7	1,476.57	1,711.9	925.45	1,373.41
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown fine-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	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
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM						
Our Reference		254288-6	254288-7	254288-8	254288-9	254288-10
Your Reference	UNITS	TP105	TP106	TP107	TP108	TP109
Depth		0-0.15	0-0.3	0-0.1	0-0.05	0-0.3
Date Sampled		24/10/2020	24/10/2020	24/10/2020	24/10/2020	24/10/2020
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	29/10/2020	29/10/2020	29/10/2020	29/10/2020	29/10/2020
Sample mass tested	g	1,422.47	1,639.2	1,472.97	1,634.4	199.43
Sample Description	-	Brown fine-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown mulch
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected Synthetic mineral fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected synthetic mineral 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 Synthetic mineral 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
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM						
Our Reference		254288-11	254288-12	254288-13	254288-14	254288-15
Your Reference	UNITS	TP110	TP111	TP112	TP113	TP114
Depth		0-0.05	0-0.05	0-0.1	0-0.3	0-0.2
Date Sampled		24/10/2020	24/10/2020	24/10/2020	24/10/2020	24/10/2020
Type of sample		soil	soil	soil	soil	soil
Date analysed	-	29/10/2020	29/10/2020	29/10/2020	29/10/2020	29/10/2020
Sample mass tested	g	1,612.3	1,572.7	1,527.3	144.46	1,274.66
Sample Description	-	Brown coarse-grained soil & rocks	Brown fine-grained soil & rocks	Brown coarse-grained soil & rocks	Brown mulch	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	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
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM		
Our Reference		254288-16
Your Reference	UNITS	TP115
Depth		0-0.1
Date Sampled		24/10/2020
Type of sample		soil
Date analysed	-	29/10/2020
Sample mass tested	g	1,487.71
Sample Description	-	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected
Total Asbestos#1	g/kg	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected
ACM >7mm Estimation*	g	–
FA and AF Estimation*	g	–
FA and AF Estimation*#2	%(w/w)	<0.001

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.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.

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

Report Comments

Asbestos-ID in soil: NEPM
This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	92407.02	**Suburb:**	EMU PLAINS	**To:**	ENVIROLAB
Project Name:	Nepean CAPA HS - Multi-Purpose Hall	**Order Number**			12 Ashley Street Chatswood NSW 2067
Project Manager:	Gavin Boyd	**Sampler:**	Jeremie Young	**Attn:**	Customer Service
Emails:	gavin.boyd@douglaspartners.com.au	kristine.nicodemus@douglaspartners.com.au			grant.russell@douglaspartners.com.au
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☑				
Prior Storage:	☐ Esky ☐ Fridge ☑ Shelved	Do samples contain 'potential' HBM?	Yes ☑	No ☐	(If YES, then handle, transport and store in accordance with FPM HAZID)

Sample ID	Lab ID	Date Sampled	Sample Type (S - soil W - water)	Container Type (G - glass P - plastic)	Analytes: Asbestos 500 ml									Notes/preservation
TP101/0-0.05m	1	24.10.2020	S	P	●									
TP101/0.2-0.3m	2	24.10.2020	S	P	●									
TP102/0-0.2m	3	24.10.2020	S	P	●									
TP103/0-0.3m	4	24.10.2020	S	P	●									
TP104/0-0.2m	5	24.10.2020	S	P	●									
TP105/0-0.15m	6	24.10.2020	S	P	●									
TP106/0-0.3m	7	24.10.2020	S	P	●									
TP107/0-0.1m	8	24.10.2020	S	P	●									
TP108/0-0.05m	9	24.10.2020	S	P	●									
TP109/0-0.3m	10	24.10.2020	S	P	●									
TP110/0-0.05m	11	24.10.2020	S	P	●									
TP111/0-0.05m	12	24.10.2020	S	P	●									
TP112/0-0.1m	13	24.10.2020	S	P	●									
TP113/0-0.3m	14	24.10.2020	S	P	●									
TP114/0-0.2m	15	24.10.2020	S	P	●									
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐

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

Job No: 254288
Date Received: 26·10·2020
Time Received: 1650
Received By: KG
Temp: Cool/Ambient
Cooling: Ice/Icepack 19·8°C
Security: Intact/Broken/None

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No:

Total number of samples in container:

Relinquished by: JY

Transported to laboratory by:

Send Results to: Douglas Partners Pty Ltd

Address: 18 Waler Crescent Smeaton Grange NSW 2567

Phone: **Fax:**

Signed:

Received by: ERS Syd

Date & Time: 26·10·2020 1650

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	92407.02	**Suburb:**	EMU PLAINS	**To:**	ENVIROLAB
Project Name:	Nepean CAPA HS - Multi-Purpose Hall	**Order Number**			12 Ashley Street Chatswood NSW 2067
Project Manager:	Gavin Boyd	**Sampler:**	Jeremie Young	**Attn:**	Customer Service
Emails:	gavin.boyd@douglaspartners.com.au	kristine.nicodemus@douglaspartners.com.au			grant.russell@douglaspartners.com.au
Date Required:	Same day ☐ 24 hours ☐ 48 hours ☐ 72 hours ☐ Standard ☑				
Prior Storage:	☐ Esky ☐ Fridge ☑ Shelved	Do samples contain 'potential' HBM?	Yes ☐	No ☑	(If YES, then handle, transport and store in accordance with FPM HAZID)

Sample ID	Lab ID	Sampling Date	Sample Type (S - soil, W - water)	Container Type (G - glass, P - plastic)	Asbestos 500 ml									Notes/preservation
TP115/0-0.1m	16	24.10.2020	S	P	●									
PQL (S) mg/kg														**ANZECC PQLs req'd for all water analytes** ☐

PQL = practical quantitation limit. If none given, default to Laboratory Method Detection Limit

Metals to Analyse: 8HM unless specified here:

Lab Report/Reference No: 254288.

Total number of samples in container: **Relinquished by:** JY **Transported to laboratory by:**

Send Results to: Douglas Partners Pty Ltd **Address:** 18 Waler Crescent Smeaton Grange NSW 2567 **Phone:** **Fax:**

Signed: **Received by:** EZS Syd **Date & Time:** 26-10-2020 1650

Appendix H

QA/QC

Appendix I

Summary Table I1 (Waste Classification)

Appendix J

About This Report