Douglas Partners
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Report on
Detailed Site Investigation (Contamination)

John Palmer Public School Upgrade
85 The Ponds Boulevard, The Ponds

Prepared for
NSW Department of Education

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Geotechnics / Environment / Groundwater

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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

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1. Introduction

This detailed site investigation (contamination) report - accompanies an Environmental Impact Statement (EIS) pursuant to Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act) in support of a State Significant Development Application (SSD - 23330227).

The development is for upgrading works comprising alterations and additions to John Palmer Public School at 85 The Ponds Boulevard, The Ponds. The site is legally described as Lot 1 DP 1131340.

The site is roughly rectangular in shape, with a total area of 29,830m^2 and street frontages to Pebble Crescent to the west, Jetty Street to the south and The Ponds Boulevard to the east. The Ponds Shopping Centre adjoins the northern property boundary of the school.

This report addresses the relevant Secretary's Environmental Assessment Requirements (SEARs), specifically:

- State Environmental Planning Policy No. 55 – Remediation of Land (1998);
- Blacktown Local Environment Plan 2015.

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); an
- NSW EPA *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020).
- Waste Classification Guidelines (EPA, 2014).
- Acid Sulphate Soil Manual (NSW Acid Sulfate Soil Management Advisory Committee 1998).
- Sampling Design Guidelines (EPA, 1995)
- Consultants Reporting on Contamination Land-Contaminated Land Guidelines (EPA, 2020).

The objective of the DSI is to assess the suitability of the site for the proposed development and whether further investigation and/or management is required. It is understood that the report will be used to support a development application for the proposed development. This DSI includes the results of additional sampling carried out on the site. A preliminary waste classification was also undertaken to assist in planning and budgeting for the disposal of surplus soils.

This report must be read in conjunction with all appendices including the notes provided in Appendix B.

A geotechnical investigation was undertaken concurrently with this investigation. The results of the geotechnical investigation are reported separately (DP Report Reference 94624.01.R.001.Rev0).

2. Proposed Development

The proposed development seeks to upgrade John Palmer Public School. The upgrade consists of the following alterations and additions:

- Construction of a new three storey building facing The Ponds Boulevarde which will accommodate 29 Permanent Learning Spaces and 1 new staff room;
- Construction of a one storey new library building;
- Relocation of service access to staff car park off The Ponds Boulevarde, including alterations to the existing car park to accommodate service vehicle;
- One-storey extension to and refurbishment of existing School Hall building. The School Hall extension will accommodate ancillary spaces for Out of Hours School Care;
- Building Block D will be re-purposed from an existing library to special program spaces and administration;
- Refurbishment of Building F to provide 1 new support unit;
- Minor additions and internal refurbishments to Building A;
- Removal of all 20 existing demountable classroom buildings once alterations and additions have been completed; and
- Ancillary works to support the alterations and additions including landscaping and service provision.

3. Background

DP has carried out the following previous investigations on-site and in the broader area:

- "Report on Preliminary Contamination Assessment: Proposed Primary School: The Ponds Boulevard, Second Ponds Creek" dated 30 April 2007 (Project Reference 44777).
- "Report on Geotechnical Investigation: Proposed Primary School: The Ponds Boulevarde, Second Ponds Creek" dated 2 March 2007 (Project Reference 41177A).
- "Report on Preliminary Contamination Assessment, Second Ponds Creek, Schofields" dated October 2001 (Project 29867A):

The Preliminary Contamination Assessment in 2007, the most recent site assessment, included a review of previous reports, NSW DEC notices, selected historical aerial photographs and sampling and analysis of samples from six test pits. The following comments were provided:

- The review of previous information indicated that the site has previously been used for grazing. Minimal filling was encountered during the geotechnical investigation, with most bores recording topsoil underlain by silty clay. Stockpiled material was noted along the western boundary during the geotechnical field work (and remnant stockpiles were still present during field work for the current assessment), and two of the geotechnical test pits were excavated through the stockpiled material. During the assessment, site personnel indicated that the stockpiled materials were locally sourced and intended for use on surrounding sites;

- In general, most test pits at the site encountered topsoil underlain by natural silty clay. Filling was encountered to maximum depths of 0.4 - 0.8 m in three of the test pits from the current investigation, all located in the northern portion of the site. Two of the test pits from the previous investigation were excavated through stockpiled material in the west of the site, and therefore recorded filling to depths of 0.4 and 0.7 m below ground surface;
- Laboratory analysis was conducted on selected samples for the various combinations of: heavy metals, Total Recoverable Hydrocarbons (TRH), Benzene, Toluene, Ethyl Benzene and Total Xylenes (BTEX), Polycyclic Aromatic Hydrocarbons (PAH), Phenols, Polychlorinated biphenyls (PCB), Organochlorine pesticides (OCP), Organophosphorus pesticides (OPP) and Asbestos;
- In consideration of the sensitive site use, laboratory results were compared with the most sensitive DEC endorsed criteria viz: the lower values of Health based Investigation levels for residential with gardens and accessible soil landuse and Provisional phytotoxicity based investigation levels for sandy loams. All laboratory results were within the relevant site assessment criteria applicable at the time of the investigation; and
- The report concluded “On the basis of the site history, observations and laboratory results the site is generally considered suitable for the proposed primary school and child care centre.

It is understood that the site was subject to a site audit assessment by Mr Graeme Nyland, however, the results of this audit are not recorded on DP’s files. DP were not made aware of any issues associated with the contamination assessment or the audit. Given that the development of the school progressed, it is assumed that the site audit provided approval for the school development.

A previous DSI was carried out on site for an overlapping development presented in a report dated 8 September 2020 (Project Reference 94624.00.R.002.Rev0). This report includes the results of this previous investigation for the new proposed development.

4. Scope of Work

The scope of work for the DSI comprised:

- A review of previous contamination reports, including the following site history information:
  - Geological, soil, acid sulfate soil, salinity and hydrogeological published information to assess and document the site’s environmental setting;
  - Current and historical title deeds;
  - Historical aerial photographs;
  - Search of the NSW EPA Land Information public databases held under the Contaminated Land Management Act 1997 and the Protection of the Environment Operations Act 1997;
  - Records held by SafeWork NSW;
  - Council Section 10.7 Planning Certificate;
- Search for groundwater bores on or adjacent to the site registered with the NSW Department of Primary Industries (DPI) Water;

- A site walkover to identify conditions that may indicate potential areas of environmental concern (PAEC);
- Completion of a Dial Before You Dig underground services records search and scan of underground services carried out by a Telstra accredited services locator;
- Drilling of thirty-two boreholes (Bores 101 to 124, 201 to 210) and excavation of ten pits (Pits 211 to 221) across the site;
- Collection of soil samples from each borehole location. Samples were collected at regular depth intervals, change of strata or indicators of potential contamination based on field observation;
- Survey of borehole and pit locations using a differential GPS;
- Laboratory analysis of selected soil samples for a range of the following contaminants and physiochemical properties:
    - Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc);
    - Polycyclic aromatic hydrocarbons (PAH);
    - Total recoverable hydrocarbons (TRH);
    - Benzene, toluene, ethylbenzene and xylene (BTEX);
    - Phenols;
    - Organochlorine pesticides (OCP), organophosphorus pesticides (OPP);
    - Polychlorinated biphenyls (PCB);
    - pH;
    - Cation exchange capacity (CEC); and
    - Asbestos.
- Field sampling and laboratory analysis included a quality assurance/quality control (QA/QC) plan consisting of approximately 10% intra-laboratory replicates and appropriate Chain of Custody procedures and in-house laboratory QA/QC testing;
- Interpretation of laboratory results in accordance with current NSW EPA endorsed guidelines; and
- Preparation of this DSI report outlining the methodology and results of the investigation, an assessment of the site's suitability for the proposed development and recommendations for further works if considered necessary.

5. Site Information

A summary of the site identification details is presented in Table 1 with the proposed building footprint (the site) shown on Figure 1.

Table 1: Site Identification

Site Address	85 The Ponds Boulevard, The Ponds
Legal Description	Lot 1 D.P. 1131340
Area	Larger school site 3.0 hectares (approximately) Development site 0.5 hectare (approximately)
Zoning	SP2 Educational Establishment
Local Council Area	Blacktown City Council (BCC)
Current Use	Primary School
Surrounding Uses	North – Commercial East – Residential South – Existing School West – Existing School

Figure 1: Site Location Plan (Source: Metro Map)

6. Environmental Setting

6.1 Topography

The regional topography generally comprises undulating hills with elevations to 60 m and 70 m Australian Height Datum (AHD). Site surface levels generally slope down to the north-west at gradients estimated to be less than 3° with the maximum elevation at about RL 59.7 (m AHD) in the south-east corner and the minimum elevation at about RL 58.1 (m AHD) in the north-west corner.

6.2 Site Geology

Reference to the Penrith 1: 100 000 scale Soil Landscape Series Sheet indicates that the site is located within the Blacktown soil landscape group. The Blacktown Group is characterised by moderately reactive, highly plastic subsoil with poor drainage characteristics.

Reference to the Penrith 1:100 000 scale Geological Series Sheet indicates that the site is underlain by Ashfield Shale of Triassic Age. Ashfield Shale typically comprises dark grey to black shale, siltstone and laminite which weathers to a residual clay profile of medium to high plasticity.

6.3 Acid Sulphate Soils

Review of published mapping indicates that the site is in an area of 'no known occurrence of acid sulfate soils'. The NSW Acid Sulfate Soils Manual 1998 published by the Acid Sulfate Soils Management Advisory Committee (ASSMAC) indicates that acid sulfate soils (ASS) (and potential acid sulfate soils – PASS) normally occur in alluvial or estuarine soils below RL 5 m AHD although occasionally are encountered up to RL 12 m AHD. Considering the ASS mapping and given that the site soils are at site elevations above RL 50 m AHD, it is considered unlikely that ASS is present on-site.

6.4 Salinity

The Department of Infrastructure, Planning and Natural Resources (DIPNR) "Map of Salinity Potential in Western Sydney 2002" suggests that the site is in an area of "moderate salinity potential" with a higher potential in the lower elevations area in close proximity to the Second Ponds Creek system.

6.5 Surface Water and Groundwater

The closest surface water receptor to the site is Second Ponds Creek located about 270 m west of the site.

Based on the local topography, groundwater is anticipated to flow to the west towards Seconds Ponds Creek.

A search of the NSW Department of Primary Industries Water (DPI Water) online map of registered groundwater works was undertaken as part of the investigation. The search carried out on 30 June 2021

identified one registered groundwater borehole within 500 m of the site that contained groundwater information. A standing groundwater level of 6.5 m was measured in the groundwater borehole located about 420 m south-west of the site.

7. Previous Reports and Site History

As part of the scope of works of this DSI, a review of the DSI report by DP dated 8 September 2020 (Project Reference 94624.00) DP (2020) was caried out.

DP (2020) comprised of a DSI of the larger school site with the purpose of identifying the potential risk of contamination. A site walkover, review of historical aerial photographs, review of EPA records, historical title deeds search, and appraisal of local geology and hydrogeology was undertaken.

A review of site history indicated that the land was predominantly used for grazing up until late 1970. From late 1970 to early 1973 the land use was not known. In early 1973 the land was marked for future development and from mid-2006 it was used for educational purposes. Prior to development for educational use, the previous known land uses were considered to have low or limited potential for contamination impact.

The site was not found on any NSW EPA published databases relating to contamination at the time the searches were carried out. Both the Section 10.7 Certificate received from Blacktown City Council and a search of Blacktown City Council's website did not indicate any contaminated land activities at the time of the reviews.

The most significant risks associated with contamination on the site were:

- Uncontrolled filling of unknown origin; and
- Previous agricultural activities on parts of the site.

It should be noted that DP (2020) did not identify any evidence of chemical storage on the site at the time. SafeWork records which were sourced following completion of DP (2020) showed no records of the storage of hazardous chemicals within the site.

Intrusive investigation was undertaken on the site in accordance with NSW EPA (1995). Samples were tested for the main contaminants of concern including heavy metals, TRH, BTEX, PAH, OCP, OPP, phenols and asbestos. Based on the findings of the investigation, including the absence of significant soil contamination, it was considered the potential for contamination on the site was relatively low.

8. Site Walkover

A site walkover was undertaken by an environmental engineer (Mr Grant Russell) and geotechnical engineer (Mr Gavin Boyd) on 31 July 2020, 29 June 2021 and 27 September 2021.

The site comprises five irregular shaped area of approximately 0.5 hectares. The site was occupied by landscaped areas, open grassed areas and concrete pavements. Some mature trees were observed on-site up to an estimated height of 20 m.

The general site topography was consistent with that described in Section 5.1. The site layout appears to have remained unchanged since the DP (2020) site walkover. No evidence of staining or other anthropogenic materials was evident during DP's site visit.

The shopping centre to the north of the school includes a single-level basement which is at approximate ground level on the western side. The basement extends to the south to the property boundary with the larger school site. A review of the shops within the shopping centre did not indicate evidence of dry cleaners, fuel points or other common retail outlets that are often sources of contamination.

Site photographs are included in Appendix C.

9. Preliminary Conceptual Site Model

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site became contaminated and how potential receptors may be exposed to contamination either in the present or the future ie: it enables an assessment of the potential source – pathway – receptor linkages (complete pathways).

A summary of the conceptual site model (CSM) for the site is presented below as adapted from DP (2020).

Table 2: Summary of Potentially Complete Exposure Pathways

Source and COPC	Transport Pathway	Receptor	Risk Management Action
S1: Fill Metals, TRH, BTEX, PAH, OCP, PCB, phenols and asbestos S2: Previous Agricultural Activities Metals, OCP and OPP	P1: Ingestion and dermal contact P2: Inhalation of dust and/or vapours	R1: Current and users [Education Facility R2: Construction and maintenance workers	An intrusive investigation is recommended to assess possible contamination including testing of the soils.
	P3: Ingestion, dermal contact and adsorption	R3: Terrestrial ecology	

10. Sampling and Analysis Quality Plan

10.1 Data Quality Objectives

The DSI was devised with reference to the seven-step data quality objective process which is provided in Appendix B Schedule B2, NEPC (2013). The DQO process is outlined in Appendix D.

10.2 Soil Sampling Rationale

Based on the CSM and DQO the following sampling rationale was adopted.

A systematic sampling strategy based on NSW EPA *Contaminated Sites, Sampling Design Guidelines* (NSW EPA, 1995) to determine borehole locations was adapted based on areas of access. Borehole locations are shown on Drawing 1, in Appendix A.

Table A of NSW EPA (1995) recommends a minimum of thirteen sampling points for a site of 0.5 ha for site characterisation based on the detection of circular hot spots using a systemic grid sampling pattern. A total of thirteen sampling locations (including three geotechnical boreholes) were therefore positioned across accessible areas of the site.

A total of 76 primary soil samples were selected for analysis with the majority from fill and three from the natural soil, given that field observations suggest that contamination is more likely to be associated with fill rather than natural soil. Five intra-laboratory replicate sample, one laboratory prepared trip spike and one laboratory prepared trip blank sample were submitted to a NATA accredited laboratory, ELS. Soil samples were analysed for COPC selected based on the potential contamination sources associated with former site uses and/or activities as identified during the site history information review and site walkover and discussed in the CSM as presented in Section 8.

Eight additional sampling points (Pits 214 to 221) were carried out around Bore 205 where an exceedance of B(a)P was previously encountered.

Soil samples were collected from each borehole and pits at depths of approximately 0.1 m, 0.5 m, 1.0 m and every 0.5 m thereafter, and changes in lithology or signs of contamination.

The general sampling methods are described in the field work methodology, included in Appendix E.

11. Site Assessment Criteria

The site assessment criteria (SAC) applied in the current investigation are informed by the CSM (Section 8) which identified human and environmental receptors to potential contamination on the site. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The investigation and screening levels applied in the current investigation comprise levels adopted for a generic residential land use scenario. The derivation of the SAC is included in Appendix F and the adopted SAC are listed on the summary analytical results tables in Appendix G.

12. Results

12.1 Field Work Results

The borehole logs for this investigation are included in Appendix H. The logs recorded the following general sub-surface profile:

- Topsoil:
  - silty clay, clayey silt or sandy silt topsoil to depths of between 0.08 m and 0.2 m in all boreholes except Bore 206;
- Fill:
  - fill to depths of between 0.5 m and 1.3 m in all boreholes except Bore 201, Bore 205 and Bore 206.
  - asphaltic concrete ranging from 20 mm to 40 mm thick at Bores 101 and 110 overlying roadbase gravel to 0.4 m depth;
  - silty clay topsoil fill with gravel, sand and vegetation to depths of 50 mm to 150 mm in all boreholes except Bores 101, 110 and 112;
  - silty clay or gravelly clay fill to depths of 0.2 m to 0.9 m in all boreholes except Bores 108, 123 and 124 where the fill was from 2.0 m to 2.2 m. Inclusions of sand, silt and gravel were encountered within the fill;
  - Concrete to depths of 150 mm to 190 mm was encountered in Bores 209 and 210;
  - A concrete fragment was encountered within the fill in Bore 203.
- Natural Clay:
  - typically stiff to very stiff silty clay in all boreholes to depths of between 1.0 m and 5.6 m;
- Weathered Bedrock:
  - weathered siltstone from depths of between 2.7 m and 5.6 m in Bores 201, 202 and 207 to termination depths of between 9.62 m and 11.56 m.

There were no other apparent records of visual or olfactory evidence (eg: staining, odours, free phase product) to suggest the presence of contamination within the soils observed in the investigation.

No free groundwater was observed during the drilling of boreholes. Backfilling of the boreholes at the completion of drilling precluded long term monitoring of the groundwater levels. It should be noted that groundwater levels are affected by climatic conditions and soil permeability and will therefore vary with time.

Review of previous relevant borehole logs from the DP (2020) investigation indicated similar sub-surface conditions except the depths of fill material were observed to be generally deeper in the northern portion of the site. No apparent signs of visual indicators of the presence of contamination were observed at the time of the investigation.

12.2 Laboratory Analytical Results

The results of laboratory analysis from the current investigation along with the relevant results from the DP (2020) investigation, are summarised in the following tables in Appendix G:

- Table G1 and G2, R1 and R2: Summary of Results of Soil Analysis; and
- Table G3: Summary of Waste Classification Assessment.

The laboratory certificates of analysis for the current investigation together with the chain of custody and sample receipt information are provided in Appendix I.

13. Discussion

13.1 Soils

The analytical results for contaminants cadmium, mercury, BTEX, TRH, naphthalene, phenols, OCP, OPP, PCB and asbestos in the soil samples were below the practical quantitation limit (PQL).

The analytical results for contaminants arsenic, chromium, copper, lead, nickel, zinc and total PAH were reported above the laboratory PQL but within the relevant SAC with the exception of two samples.

The analytical results for benzo(a)pyrene B(a)P and TEQ were all below the laboratory PQL or within the SAC except for one sample. The concentration of benzo(a)pyrene B(a)P in sample BH205/0.1 was 2.2 mg/kg which exceeded the ESL – A of 0.7 mg/kg and the concentration of benzo(a)pyrene TEQ of 3.1 mg/kg exceeded the HIL – A of 3 mg/kg. Subsequent testing around Bore 205 indicated that this exceedance was localised to BH205/0.1m depth. Statistical analysis of the B(a)P results from the previous and current investigations of the fill material across the site was undertaken, using the USEPA ProUCL program. The 95% UCL of the arithmetic mean for benzo(a)pyrene B(a)P in the samples was within the EIL of 0.7 mg/kg;

It is noted that the B(a)P ESL is a low reliability value. Higher reliability screening levels have been published in CRC CARE *Risk-based Management and Remediation Guidance for Benzo(a)pyrene* (CRC CARE, 2017). The high reliability value of 33 mg/kg (or ranging from 21 mg/kg to 135 mg/kg) for fresh B(a)P suggests that the concentrations of B(a)P detected at the site are unlikely to pose an unacceptable risk to terrestrial ecology and therefore the exceedance is not considered to be of concern.

A minor exceedance of Copper in Bore 212/0.2-0.3 m was 66 mg/kg with which exceeded the ESL-A value of 55 mg/kg. Statistical analysis of the Copper from the previous and current investigations of the fill material across the site was undertaken, using the USEPA ProUCL program. The 95% UCL of the arithmetic mean for copper in the samples was within the EIL of 55 mg/kg;

Based on the above, the benzo(a)pyrene and copper exceedances of the HILs and EILs are not considered to be statistically significant.

13.2 Asbestos

Reported concentrations of asbestos in the soil samples were below the laboratory limit of reporting of 0.1 g/kg.

13.3 Preliminary Waste Classification

In order to assess the potential waste classification for fill soils to be removed as part of the proposed development, a preliminary waste classification of fill soils in the boreholes was undertaken.

The NSW EPA (2014) *Waste Classification Guidelines* contains a six-step procedure for determining the type of waste and the waste classification. Part of the procedure, for materials not classified as special waste or pre-classified waste, is a comparison of analytical data initially against contaminant threshold (CT) values specific to a waste category. Alternatively, the data can be assessed against specific contaminant concentration (SCC) thresholds when used in conjunction with TCLP thresholds.

The CT, SCC, and TCLP values relevant to this preliminary waste classification are shown in Table G3, Appendix G.

The following Table 3 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 3: Six Step Classification

Step	Comments	Rationale
1. Is it special waste?	No	No asbestos-containing materials (ACM), coal tar, clinical or related waste, or waste tyres were detected in any samples or observed on the site surface or in any of the boreholes Asbestos was not detected by the analytical laboratory.
2. Is it liquid waste?	No	Materials composed of a soil matrix.
3. Is the waste "pre-classified"?	No	The fill is not pre-classified with reference to NSW EPA (2014).
4. Does the Waste have hazardous waste characteristics	No	The fill 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. Chemical Assessment	Conducted	Refer to Table G3 in Appendix G.
6. Is the waste putrescible or non-putrescible?	Non-putrescible	The fill does not contain materials considered to be putrescible[a].

Note: a wastes that are generally not classified as putrescible include soils, timber, garden trimmings, agricultural, forest and crop materials, and natural fibrous organic and vegetative materials (NSW EPA, 2014).

All sample analysis was conducted by Envirolab Services in accordance with the chain-of-custody prepared by DP.

As shown in Table G3, all contaminant concentrations for the analysed fill samples were within the contaminant thresholds (CT1s) for General Solid Waste (GSW), except for benzo(a)pyrene in BH205 at 0.1 m. A TCLP test was conducted for benzo(a)pyrene on sample BH205/0.1. The SCC and TCLP concentrations for BH205/0.1 were within the contaminant thresholds SCC1 and TCLP1, for GSW, respectively.

With respect to the classification of the natural soils, the samples collected and analysed from the natural soils reported concentrations below the PQL apart from some metals, which were considered to be within background concentrations for Sydney. The natural soils did not display signs of contamination (i.e., odours, staining). Given this and that the fill recorded low levels of contamination, the natural soils encountered within the depth of this investigation are therefore considered to have a preliminary classification of virgin excavated natural material (VENM).

Note: The information provided in this section does not constitute a formal waste classification for off-site disposal purposes. Should any fill or soils require off-site disposal a formal waste classification assessment must be undertaken and reported. In addition, if any soil or fill materials are designated for off-site re-use (other than VENM) then a formal classification must be undertaken under the appropriate Resource Recovery Order.

13.4 Data Quality Assurance and Quality Control

The data quality assurance and quality control (QA/QC) results are included in Appendix J. Based on the results of the field QA and field and laboratory QC, and evaluation against the data quality indicators (DQI) it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

14. Conclusions and Recommendations

The DSI comprised a review of previous contamination reports including site history, a site walkover and an intrusive soil investigation to provide recommendations and data on the contamination status at the site proposed for redevelopment.

Contaminant concentrations in all the soil samples tested were below the adopted PQL and or SAC except for an exceedance of benzo(a)pyrene TEQ at BH205 and copper at BH214. Based on the above, the benzo(a)pyrene and copper exceedances of the HILs and EILs are not considered to be statistically significant.

Based on the findings of this investigation and the comments provided in Section 13, DP concludes that the potential for contamination constraints at the site is considered to be relatively low. Given the absence of any indicators of significant soil contamination at the site, groundwater investigations are not considered to be required at this time.

However, as with any site, there is always the potential that concealed structures and / or contaminated materials may be present at the site, and this should be considered during bulk earthworks for the proposed development. Furthermore, an Unexpected Finds Protocol will need to be established for use

during earthworks, to ensure that due process is carried out in the event of a possible contaminated find.

Based on the results of the DSI it is considered that the site can be made suitable for the proposed development subject to implementation of the recommendations above.

15. References

CRC CARE. (2017). *Risk-based Management and Remediation Guidance for Benzo(a)pyrene.* Technical Report no. 39: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

NSW EPA. (1995). *Contaminated Sites, Sampling Design Guidelines.* NSW Environment Protection Authority.

NSW EPA. (2014). *Waste Classification Guidelines, Part 1: Classifying Waste.* NSW Environment Protection Authority.

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land.* Contaminated Land Guidelines: NSW Environment Protection Authority.

16. Limitations

Douglas Partners (DP) has prepared this report for this project at John Palmer Public School, The Ponds in accordance with DP's proposal dated 2 June 2021 and was commissioned by the NSW Department of Education – Schools Infrastructure. The work was carried out under School Infrastructure NSW Standard Form Agreement SINSW02064/21 dated 6 July 2021. This report is provided for the exclusive use of NSW Department of Education 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.

The assessment of atypical safety hazards arising from this advice is restricted to the (geotechnical / environmental / groundwater) components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached 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.

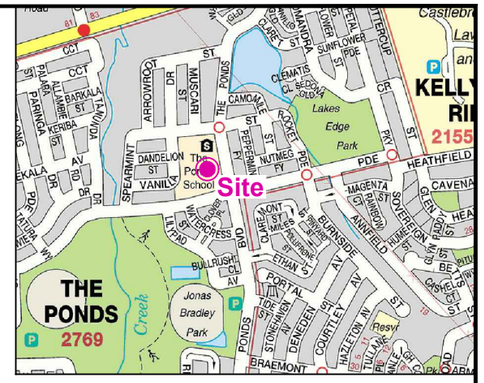
Asbestos has not been detected by observation or by laboratory analysis, either on the surface of the site, or in filling materials at the test locations sampled and analysed. Building demolition materials, such as concrete, were, however, located in previous below-ground filling and these are considered as indicative of the possible presence of hazardous building materials (HBM), including asbestos.

Although the sampling plan adopted for this investigation is considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been sampled and analysed. This is either due to undetected variations in ground conditions or to budget constraints (as discussed above), or to parts of the site being inaccessible and not available for inspection/sampling, or to vegetation preventing visual inspection and reasonable access. It is therefore considered possible that HBM, including asbestos, may be present in unobserved or untested parts of the site, between and beyond sampling locations, and hence no warranty can be given that asbestos is not present.

Douglas Partners Pty Ltd

Appendix A

Drawing



Location Plan

N

0 10 20 30 40 50m

SCALE 1:1250 (A3)

LEGEND:-

- Borehole locations (September 2021)
- Test pit location (September 2021)
- Borehole locations (August 2020)
- Previous test pit location (Project 41177A, February 2007)
- Previous test pit location (Project 44777, April 2007)
- Library
- Extension to Building A
- Approximate footprint of proposed buildings
- Approximate footprint of proposed car park
- Approximate footprint of proposed extensions
- Approximate site boundary

NOTE:-

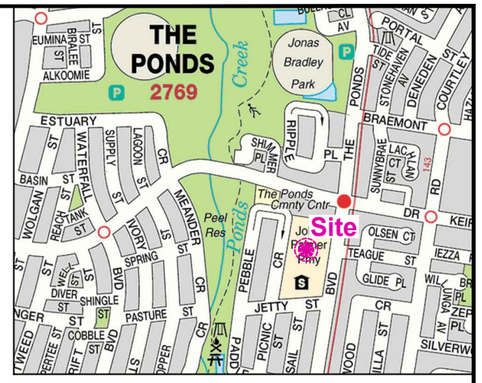
1. Test locations are approximate only and are shown with reference to existing site features.
2. Image obtained from Near Map. Date of imagery 21-06-2020.

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: Woolacotts Consulting Engineers Pty Ltd		TITLE: **Site and Test Location Plan** **John Palmer Public School Upgrade** **85 The Ponds Boulevard, The Ponds**
OFFICE: North West Sydney	DRAWN BY: JST	
SCALE: As shown	DATE: 8 October 2021	

PROJECT No:	94624.01
DRAWING No:	1
REVISION:	0

P:\NSW\94624.01\94624.01.D.001.Rev0.dwg



Location Plan

0 5 10 15 20

SCALE 1: 500 (A3)

LEGEND:-

- Borehole Location and Number
- Previous borehole location (Project 94624.00, September 2020)

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.
2. Image obtained from Metromap. Date of imagery 29-08-2020.

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: NSW Department of Education		
OFFICE: North West Sydney	DRAWN BY: JST	
SCALE: As shown	DATE: 8 October 2021	

TITLE: **Site and Test Location Plan**
John Palmer Public School Upgrade
85 The Ponds Boulevard, The Ponds

PROJECT No:	94624.01
DRAWING No:	1A
REVISION:	0

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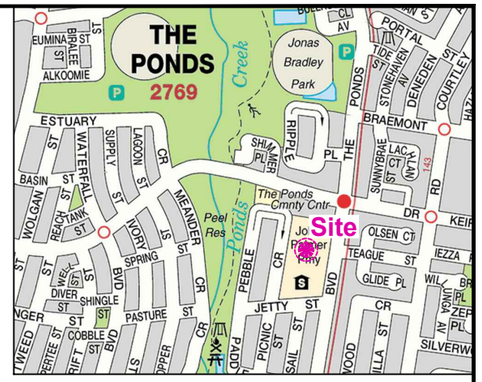


Location Plan

N

LEGEND:-

- Borehole locations (September 2021)
- Previous borehole location (July 2021)
- Previous borehole location (Project 94624.00, September 2020)

NOTE:-

1. Test locations are approximate only and are shown with reference to existing site features.
2. Image obtained from Metromap. Date of imagery 29-08-2020.

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: NSW Department of Education		
OFFICE: North West Sydney	DRAWN BY: JST	
SCALE: NTS	DATE: 8 October 2021	

TITLE: **Site and Test Location Plan**
John Palmer Public School Upgrade
85 The Ponds Boulevard, The Ponds

PROJECT No:	94624.01
DRAWING No:	1B
REVISION:	0

P:\NSW\94624.01\94624.01.D.001B.Rev0.dwg

Appendix B

About This Report

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

Borehole and Test Pit Logs

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

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

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

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

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

DATA FOR DESCRIPTION AND CLASSIFICATION OF SOILS – Page 1

Major Divisions				Description		Field Identification			
				Group Symbol*	Typical Name	Grading		Nature of Fines	Dry Strength
COARSE-GRAINED SOILS	More than 65% by dry mass, (excluding that larger than 63 mm) is greater than 0.075 mm	GRAVEL	More than 50% of coarse grains are greater than 2.36 mm	GW	Well graded gravels and gravel-sand mixtures, little or no fines.	Good	Wide range in grain size	'Clean' materials (not enough fines to bind grains)	None
				GP	Poorly graded gravels and gravel-sand mixtures, little or no fines.	Poor	Predominantly one size or gap graded		
		GRAVELLY SOILS		GM	Silty gravels, gravel-sand-silt mixtures.	Good to Fair	'Dirty' materials with excess of fines	Fines are non-plastic	None to medium
				GC	Clay gravels, gravel-sand-clay mixtures.			Fines are plastic	Medium to high
		SAND	More than 50% of coarse grains are less than 2.36 mm	SW	Well graded sands and gravelly sands, little or no fines.	Good	Wide range in grain size	'Clean' materials (not enough fines to bind grains)	None
				SP	Poorly graded sands and gravelly sands, little or no fines.	Poor	Predominantly one size or gap graded		
		SANDY SOILS		SM	Silty sand, sand-silt mixtures.	Good to Fair	'Dirty' materials with excess of fines	Fines are non-plastic	None to medium
				SC	Clayey sands, sand-clay mixtures.			Fines are plastic	Medium to high
* For coarse grained soils where the fines content is between 5% and 12%, the soil shall be given a dual classification eg GP-GM.						Dry Strength		Dilatancy	Toughness
FINE-GRAINED SOILS	More than 35% by dry mass, (excluding that larger than 63 mm) is less than 0.075 mm	Liquid Limit less than 35%		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands.	None to low		Slow to rapid	Low
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	Medium to high		None to slow	Medium
				OL	Organic silts and organic silty clays of low plasticity	Low to medium		Slow	Low
		35% <LL< 50%		CI	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	Medium to high		None to slow	Medium
		Liquid Limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts.	Low to medium		None to slow	Low to medium
				CH	Inorganic clays of high plasticity, fat clays.	High to very high		None	High
				OH	Organic clays of medium to high plasticity.	Medium to high		None to very slow	Low to medium
				Pt	Peat muck and other highly organic soils.	Readily identified by colour, odour, spongy feel and generally fibrous texture			

ORDER OF DESCRIPTION

In the soil description the terms should be given in the following order:

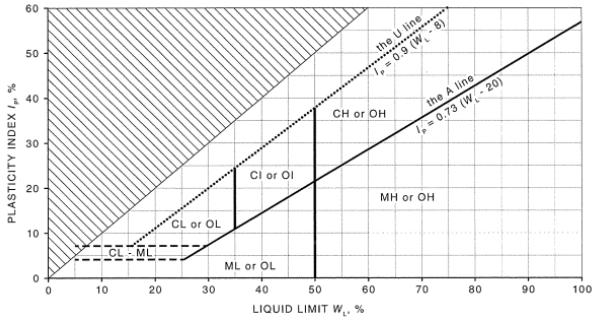
- SOIL NAME & UNIFIED CLASSIFICATION SYMBOL.
- Plasticity, behavioural or particle characteristics of the primary soil component
- Colour
- Secondary soil components' name(s), estimated proportion(s), plasticity, behavioural or particle characteristics, colour and where practical, its plasticity
- Moisture Condition (disturbed or undisturbed state)
- Consistency of fine-grained soils (undisturbed state only)
- Relative density of coarse-grained soils (determined by in situ tests)
- Structure of soil (in undisturbed state)
  - Zoning
  - Defects
  - Cementing
- Origin of soil
- Additional observations

EXAMPLES:

Silty SAND SM: fine to coarse grained, light brown, 15% non-plastic fines, with gravel, 20% angular particles, moist, apparently dense in place, alluvial.

SILT ML: low plasticity, brown, trace fine sand, w > PL, firm, estuarine.

PLASTICITY CHART (after AS 1726:2017)



The classification system excludes the boulder and cobble fractions of the soil and classifies only the materials less than 63 mm in size.

PARTICLE SIZES

Boulders	> 200 mm
Cobbles	63 mm to 200 mm
Gravel	2.36 mm to 63 mm
Sand	0.075 mm to 2.36 mm
Silt and Clay	< 0.075 mm

SAND			SILT
COARSE	MEDIUM	FINE	SILT
2.36-0.6 mm	0.6-0.2 mm	0.2-0.075 mm	0.075-0.002 mm
			

DATA FOR DESCRIPTION AND CLASSIFICATION OF SOILS – Page 2

GRAVEL

Density	Field Test
LOOSE	By inspection of voids and particle packing.
DENSE	

SAND

Density	Field Test	DPT Blows per 300 mm[1]		SPT N Blows	CPT q_c MPa	Relative Density %	Estimated Friction Angle
		Dry[2]	Wet[3]				
VERY LOOSE	Easily penetrated with 13 mm reinforcing rod pushed by hand.	< 1	0	0 – 4	0 – 2	0 – 15	25 - 30
LOOSE	Easily penetrated with 13 mm reinforcing rod pushed by hand. Can be excavated with a spade; 50 mm wooden peg can be easily driven.	1 - 3	< 1	4 – 10	2 – 5	15 – 35	27 - 32
MEDIUM DENSE	Penetrated 300 mm with 13 mm reinforcing rod driven by 2 kg hammer – hard shovelling.	3 - 8	1 - 6	10 – 30	5 – 15	35 – 65	30 - 35
DENSE	Penetrated 300 mm with 13 mm reinforcing rod driven with 2 kg hammer, requires pick for excavation; 50 mm wooden peg hard to drive	8 – 15	6 - 10	30 – 50	15 – 25	65 – 85	35 - 40
VERY DENSE	Penetrated only 25 – 50 mm with 13 mm reinforcing rod driven by 2 kg hammer.	> 15	> 10	> 50	> 25	85 – 100	38 - 43

[1]Valid for depths up to approx 1m bgl; [2]At a mc of approx. 3%-5%; [3]At a mc of approx. 15%.

SILT & CLAY

Consistency	Field Test		DCP Blows per 150 mm	SPT N Blows	Undrained Shear Strength C_u Shear Vane (kPa)	Unconfined Compressive Strength q_u PP* (kPa)	CPT q_c kPa
VERY SOFT	Easily penetrated > 40 mm by thumb. Exudes between thumb and fingers when squeezed in hand	Shear Vane Preferred	< 1	< 2	< 12	< 25	0 - 180
SOFT	Easily penetrated 10 mm by thumb. Moulded by light finger pressure.		1 – 1.5	2 – 4	12 – 25	25 – 50	180 - 375
FIRM	Impression by thumb with moderate effort. Moulded by strong finger pressure		1.5 – 3	4 – 8	25 – 50	50 – 100	375 - 750
STIFF	Slight impression by thumb cannot be moulded with finger		3 – 6	8 – 16	50 – 100	100 – 200	750 - 1500
VERY STIFF	Very tough. Readily indented by thumbnail.		6 – 12	16 – 32	100 – 200	200 – 400	1500 - 3000
HARD	Brittle. Indented with difficulty by thumbnail.		> 12	> 32	> 200	> 400	> 3000
FRIABLE	Easily crumbled or broken into small pieces by hand.						

* Pocket Penetrometer (**PP**) may overestimate q_u by a factor of 1.5 to 2.0.

Note: Visual-tactile assessment is indicative only. Use in-situ testing for logging

MOISTURE OF FINE GRAINED SOILS

Moist, dry of plastic limit	w < PL	Wet, near liquid limit	w ≈ LL
Moist, near plastic limit	w ≈ PL	Wet, wet of liquid limit	w > LL
Moist, wet of plastic limit	w > PL		

DEGREE OF SATURATION OF SANDS

Condition of Sand	Criteria	Degree of Saturation (%)
Dry	Non-cohesive and free-running	0 – 25%
Moist	Feels cool, darker colour, grains tend to adhere to one another	25 – 75%
Wet	Feels cold, makes hands wet, should be close to water table	75 – 99%

FIELD IDENTIFICATION PROCEDURE FOR FINE GRAINED SOILS OR FRACTIONS

These procedures are to be performed on the minus 0.4 mm sieve size particles. For field classification purposes, screening is not intended, simply remove by hand the coarse particles that interfere with the tests.

Dilatancy (Reaction to shaking):

After removing particles larger than 0.4 mm sieve size, prepare a pat of moist soil with a volume of about 8000 mm^3. Add enough water if necessary to make the soil soft but not sticky. Place the pat in the open palm of one hand and shake horizontally, striking vigorously against the other hand several times. A positive reaction consists of the appearance of water on the surface of the pat which changes to a livery consistency and becomes glossy. When the sample is squeezed between the fingers, the water and gloss disappear from the surface, the pat stiffens and finally it cracks or crumbles. The rapidity of appearance of water during shaking and of its disappearance during squeezing assist in identifying the character of the fines in a soil. Very fine clean sands give the quickest and most distinct reaction whereas a plastic clay has no reaction. Inorganic silts, such as a typical rock flour, show a moderately quick reaction.

Dry Strength (Crushing characteristics):

After removing particles larger than 0.4 mm sieve size, mould a pat of soil to the consistency of putty, adding water if necessary. Allow the pat to dry completely by oven sun or air drying, and then test its strength by breaking and crumbling between the fingers. This strength is a measure of the character and quantity of the colloidal fraction contained in the soil. The dry strength increases with increasing plasticity.

High dry strength is characteristic for clays of the CH group. A typical inorganic silt possesses only very slight dry strength. Silty fine sands and silts have about the same dry strength but can be distinguished by the feel when powdering the dried specimen. Fine sand feels gritty whereas a typical silt has the smooth feel of flour.

Toughness (Consistency near plastic limit):

After removing particles larger than the 0.4 mm sieve size, a specimen of soil about 12 mm cube in size, is moulded to the consistency of putty. If too dry, water must be added and if sticky, the specimen should be spread out in a thin layer and allowed to lose some moisture by evaporation. Then the specimen is rolled out by hand on a smooth surface or between the palms into a thread about 3 mm in diameter. The thread is then folded and re-rolled repeatedly. During this manipulation the moisture content is gradually reduced, and the specimen stiffens, finally loses its plasticity, and crumbles when the plastic limit is reached. After the thread crumbles, the pieces should be lumped together, and a slight kneading action continued until the lump crumbles.

The tougher the thread near the plastic limit and the stiffer the lump when it finally crumbles, the more potent is the colloidal clay fraction in the soil. Weakness of the thread at the plastic limit and quick loss of coherence of the lump below the plastic limit indicate either inorganic clay or low plasticity, or materials such as kaolin-type clays and organic clays which occur below the A-line.

Highly organic clays have a very weak and spongy feel at the plastic limit.

PROPORTION OF MINOR AND SECONDARY COMPONENTS

Term	Meaning	Approximate Proportion	
		Coarse Soils	Fine Soils
Trace	Just detectable by feel or eye. Soil properties of main component virtually unaffected.	< 5% fines < 15 % coarse fraction	< 15% sand / gravel
With	Easily detectable by feel or eye. Soil properties only slightly affected by minor components.	5% – 12% fines 15% – 30% coarse fraction	15% – 30% sand / gravel
Prefix	Easily detected by feel or eye. Soil properties significantly affected by secondary components.	> 12% fines > 30% coarse fraction	> 30% sand / gravel

PROPORTIONS OF SECONDARY COMPONENTS

5%	12%	35%
		

DATA FOR DESCRIPTION AND CLASSIFICATION OF ROCK

SEDIMENTARY ROCK TYPE DEFINITIONS

Rock Type	Definition
Conglomerate	More than 50% of the rock consists of gravel sized (greater than 2 mm) fragments.
Sandstone	More than 50% of the rock consists of sand sized (0.06 mm to 2 mm) grains.
Siltstone	More than 50% of the rock consists of silt-sized (less than 0.06 mm) granular particles and the rock is not laminated.
Claystone	More than 50% of the rock consists of clay or sericitic material and the rock is not laminated.
Shale	More than 50% of the rock consists of silt or clay sized particles and the rock is laminated.

Rocks possessing characteristics of two groups are described by their predominant particle size with reference also to the minor constituents, e.g. Clayey SANDSTONE, Sandy SHALE.

DEGREE OF WEATHERING

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

DW*

*If highly and moderately weathered rock cannot be differentiated use the term, 'Distinctly Weathered (DW)'.

ORDER OF DESCRIPTION

In the rock description the terms should be given in the following order:
ROCK NAME
Grain size and type
Colour
Fabric and texture
Inclusions and minor components
Moisture content
Durability
Strength
Weathering and/or alteration
Defects – type, orientation, spacing, roughness
Stratigraphic unit
Geological structure

STRATIFICATION

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

DEGREE OF FRACTURING

This classification applies to diamond drill cores and refers to the spacing of all types of natural fractures along which the core discontinuous. These include bedding plane partings, joints and other rock defects, **but exclude artificial fractures such as drilling breaks.**

Term	Description
Fragmented	The core is comprised primarily of fragments of length less than 20 mm, and mostly of width less than the core diameter
Highly Fractured	Core lengths are generally less than 20 mm to 40 mm with occasional fragments
Fractured	Core lengths are mainly 30 mm to 100 mm with occasional shorter and longer sections
Slightly Fractured	Core lengths are generally 300 mm or longer with occasional sections of 100 mm to 300 mm
Unbroken	The core contains very few fractures

ROCK STRENGTH

Rock strength is classified using the unconfined compressive strength (UCS). Where adequate UCS data are not available then the classification may be based on the Point Load Strength ($I_{S(50)}$) and refers to the strength of the rock substance in the direction normal to the bedding.

Strength Term	UCS MPa	Field Guide	Approx $I_{S(50)}$ MPa
Material less than very low strength is to be described using soil properties			
Very Low	2	Material crumbles under firm blows with sharp end of pick; can be peeled with knife. Pieces up to 30 mm thick can be broken by finger pressure.	0.1
Low	6	Easily scored with a knife; indentations 1 mm to 3 mm show in the specimen with firm blows of the pick point; has dull sound under hammer. A piece of core 150 mm long by 50 mm diameter may be broken by hand. Sharp edges of core may be friable and break during handling.	0.3
Medium	20	Readily scored with a knife; a piece of core 150 mm long by 50 mm diameter can be broken by hand with difficulty.	1.0
High	60	A piece of core 150 mm long by 50 mm diameter cannot be broken by hand but can be broken by a pick with a single firm blow; rock rings under hammer.	3.0
Very High	200	Hand specimen breaks with pick after more than one blow; rock rings under hammer.	10.0
Extremely High		Specimen requires many blows with geological pick to break through intact material; rock rings under hammer.	

The approximate point load strength ($I_{S(50)}$) is based on an assumed ratio to UCS of 1:20. This ratio may vary widely and should be determined for each site and rock type.

DISCONTINUITIES / DEFECTS

The actual defect is described not the process which formed or may have formed it, e.g. 'sheared zone', not 'zone of shearing'; the latter suggests a currently active process.

Spacing*:

A measure of the spacing of discontinuities. Measure mean and range of spacings for each set where possible (do not use descriptive terms).

Thickness, openness:

Measured in millimetres normal to plane of the discontinuity.

Persistence*:

The areal extent of a discontinuity. Give trace lengths in metres.

Roughness and Shape*:

A measure of the inherent surface unevenness and waviness of the defect relative to its mean plane.

Coating or Infilling:

Clean: no visible coating or infilling.

Stained: no visible coating or infilling but surfaces are discoloured by mineral staining.

Veneer: a visible coating or infilling of soil or mineral substance but usually unable to be measured (less than 1 mm).

Patchy Veneer: if discontinuous over the plane.

Coating: a visible coating or infilling of soil or mineral substance, greater than 1 mm thick. Describe composition and thickness.

* Usually determined in field exposures

Roughness:

Very Rough
Rough
Smooth
Polished
Slickensided

Shape*:

Planar
Curved
Undulating
Stepped
Irregular

Discontinuity Spacing in Three Dimensions:

The spacing of discontinuities in exposures may be described with reference to the size and shape of rock bounded by the discontinuities.

Equidimensional	Same size in all directions
Tabular	Thickness much less than length or width
Columnar	Height much greater than cross section
Polyhedral	Irregular defects without obvious pattern

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.

Symbols & Abbreviations

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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

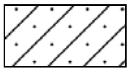
Soils


Topsoil

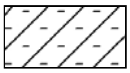

Peat


Clay

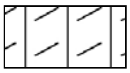

Silty clay

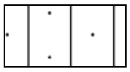

Sandy clay

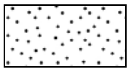

Gravelly clay

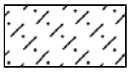

Shaly clay

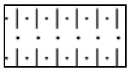

Silt


Clayey silt


Sandy silt

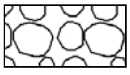

Sand

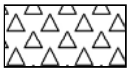

Clayey sand


Silty sand


Gravel


Sandy gravel


Cobbles, boulders

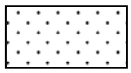

Talus

Sedimentary Rocks

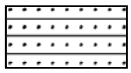

Boulder conglomerate

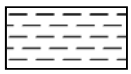

Conglomerate


Conglomeratic sandstone

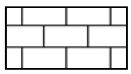

Sandstone


Siltstone


Laminite

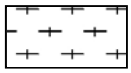

Mudstone, claystone, shale

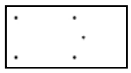

Coal


Limestone

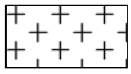
Metamorphic Rocks

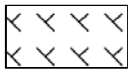

Slate, phyllite, schist

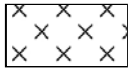

Gneiss

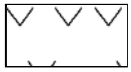

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

Appendix C

Site Photographs

Photo 1 - Site looking towards the north

Photo 2 - Site looking towards the north-east

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs	PROJECT:	94624.01
	John Palmer Public School Upgrade	PLATE No:	1
	85 The Ponds Boulevard, The Ponds	REV:	A
	CLIENT: NSW Department of Education	DATE:	Jun-21

Photo 3 - Site looking towards the north-west

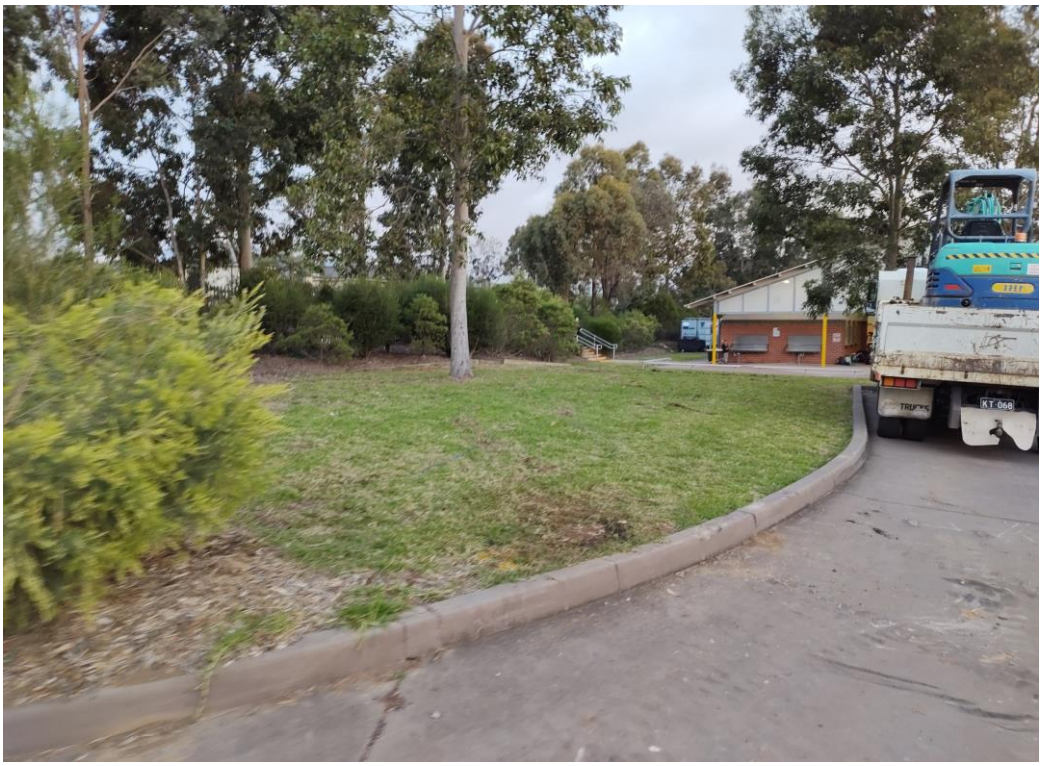


Photo 4 - Site looking towards the south-east

Douglas Partners Geotechnics / Environment / Groundwater	Site Photographs	PROJECT:	94624.01
	John Palmer Public School Upgrade	PLATE No:	2
	85 The Ponds Boulevard, The Ponds	REV:	A
	CLIENT: NSW Department of Education	DATE:	Jun-21

Appendix D

Data Quality Objectives

Appendix D
Data Quality Objectives
85 The Ponds Boulevard, The Ponds

D1.0 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 NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).

Step	Summary
1: State the problem	The objective of the investigation is to confirm the contamination status of the site with respect to the proposed land use. The report is being undertaken as the land is to be redeveloped for the expansion of John Palmer Public School. A preliminary conceptual site model (CSM) has previously been prepared (Section 8) for the proposed development. The project team consisted of experienced environmental engineers, geotechnical engineers and scientists working in the roles of Project Principal, Project Reviewer, Project Manager, field staff.
2: Identify the decisions / goal of the study	The site history has identified possible contaminating previous uses which are identified in the CSM (Section 8). The CSM identifies the associated contaminants of potential concern (COPC) and the likely impacted media. The site assessment criteria (SAC) for each of the COPC are detailed in Appendix F. The decision is to establish whether or not the results fall below the SAC or whether or not the 95% upper confidence limit of the sample population falls below the SAC. On this basis, an assessment of the site's suitability from a contamination perspective and whether (or not) further assessment and / or remediation will be derived.
3: Identify the information inputs	Inputs to the investigation will be the results of analysis of samples to measure the concentration of COPC identified in the CSM (Section 8) at the site using NATA accredited laboratories and methods, where possible. The SAC for each of the COPC are detailed in Appendix F.
4: Define the study boundaries	The lateral boundaries of the investigation area are shown on Drawing 1, Appendix A. The vertical boundaries are to the extent of contamination impact as determined from the site history assessment and site observations. The assessment is limited to the timeframe over which the field investigation was undertaken.
5: Develop the analytical approach (or decision rule)	The decision rule is to compare all analytical results with SAC (Appendix F, based on NEPC (2013)). Where guideline values are absent, other sources of guideline values accepted by NEPC (2013) shall be adopted where possible. Where a sample result exceeds the adopted criterion, a further site-specific assessment will be made as to the risk posed by the presence of that contaminant(s). Initial comparisons will be with individual results then, where required, summary statistics (including mean, standard deviation and 95% upper confidence limit (UCL) of the arithmetic

Step	Summary
	mean (95% UCL) to assess potential risks posed by the site contamination. Quality control results are to be assessed according to their relative percent difference (RPD) values. For field duplicates, triplicates and laboratory results, RPDs should generally be below 30%; for field blanks and rinsates, results should be at or less than the limits of reporting (NEPC, 2013). The field and laboratory quality assurance assessment is included in Appendix J.
6: Specify the performance or acceptance criteria	Baseline condition: Contaminants at the site exceed human health and environmental SAC and poses a potentially unacceptable risk to receptors (null hypothesis). Alternative condition: Contaminants at the site comply with human health and environmental SAC and as such, do not pose a potentially unacceptable risk to receptors (alternative hypothesis). Unless conclusive information from the collected data is sufficient to reject the null hypothesis, it is assumed that the baseline condition is true.
7: Optimise the design for obtaining data	As the purpose of the sampling program is to assess for potential contamination across the site, the sampling program is reliant on professional judgement to identify and sample the potentially affected areas. Further details regarding the proposed sampling plan are presented in Section 9.

References

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

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Appendix E

Field Work Methodology

Appendix E
Field Work Methodology
85 The Ponds Boulevard, The Ponds

E1.0 Guidelines

The following key guideline was consulted for the field work methodology:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).

E2.0 Soil Sampling

Soil sampling is carried out in accordance with DP standard operating procedures. The general sampling and sample management procedures comprise:

- Collect soil samples directly from the solid flight auger at the nominated sample depths;
- Transfer samples in laboratory-prepared glass jars with Teflon lined lids by hand, capping immediately and minimising headspace within the sample jar;
- Collect ~40 g to 50 g samples in zip-lock bags for asbestos (presence / absence) analysis;
- Wear a new disposable nitrile glove for each sample point thereby minimising potential for cross-contamination;
- Collect 10% replicate samples for QC purposes;
- Label sample containers with individual and unique identification details, including project number, sample location and sample depth (where applicable);
- Place samples into a cooled, insulated and sealed container for transport to the laboratory;
- Laboratory-prepared trip blanks and spikes were taken and subject to the same jar storage and transfer as the field samples;
- Use chain of custody documentation so that sample tracking and custody can be cross-checked at any point in the transfer of samples from the field to the laboratory; and
- Dispatching primary and replicate samples to Envirolab Services Pty Ltd (ELS) a National Association of Testing Authorities (NATA) accredited laboratory for the tests performed.

E3.0 References

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

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Appendix F

Site Assessment Criteria

Appendix F
Site Assessment Criteria
85 The Ponds Boulevard, The Ponds

F1.0 Introduction

F1.1 Guidelines

The following key guidelines were consulted for deriving the site assessment criteria (SAC):

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).
- CRC CARE *Health screening levels for petroleum hydrocarbons in soil and groundwater* (CRC CARE, 2011).

F1.2 General

The SAC applied in the current investigation are informed by the CSM which identified human and environmental receptors to potential contamination at the site. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The following inputs are relevant to the selection and/or derivation of the SAC:

- Land use: Primary School
  - Corresponding to land use category 'A', residential with garden / accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry)), also includes children's day care centres, preschools and primary schools.
- Soil type: clay.

F2.0 Soils

F2.1 Health Investigation and Screening Levels

The generic health investigation levels (HIL) and health screening levels (HSL) are considered to be appropriate for the assessment of human health risk via all relevant pathways of exposure associated with contamination at the site. The adopted soil HILp and HSL for the contaminants of concern are in Table 1 and Table 2.

Table 1: Health Investigation Levels (mg/kg)

Contaminant	HIL-A
Metals	
Arsenic	100
Cadmium	20
Chromium (VI)	100
Copper	6000
Lead	300
Mercury (inorganic)	40
Nickel	400
Zinc	7400
PAH	
B(a)P TEQ	3
Total PAH	300
Phenols	
Phenol	3000
Pentachlorophenol	100
OCP	
DDT+DDE+DDD	240
Aldrin and dieldrin	6
Chlordane	50
Endosulfan	270
Endrin	10
Heptachlor	6
HCB	10
Methoxychlor	300
OPP	
Chlorpyrifos	160
PCB	
PCB	1

Table 2: Health Screening Levels (mg/kg)

Contaminant	HSL-A&B
CLAY	**0 m to <1 m**
Benzene	0.7
Toluene	480
Ethylbenzene	NL
Xylenes	110
Naphthalene	5
TRH F1	50
TRH F2	280

Notes: TRH F1 is TRH C_6-C_{10} minus BTEX

TRH F2 is TRH >C_{10}-C_{16} minus naphthalene

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'

The HSL for direct contact derived from CRC CARE (2011) are in 3.

Table 3: Health Screening Levels for Direct Contact (mg/kg)

Contaminant	DC HSL-A	DC HSL-B
Benzene	100	140
Toluene	14 000	21 000
Ethylbenzene	4500	5900
Xylenes	12 000	17 000
Naphthalene	1400	2200
TRH F1	4400	5600
TRH F2	3300	4200
TRH F3	4500	5800
TRH F4	6300	8100

Notes: TRH F1 is TRH C_6-C_{10} minus BTEX

TRH F2 is TRH >C_{10}-C_{16} minus naphthalene

F2.2 Asbestos in Soil

Based on the CSM and/or current site access limitations, a detailed asbestos assessment was not considered to be warranted at this stage. However, due to the history of widespread use of ACM products across Australia, ACM can be encountered unexpectedly and sporadically at a site. Therefore,

the presence or absence of asbestos at a limit of reporting of 0.1 g/kg (AS:4964) has been adopted for this investigation / assessment as an initial screen.

F2.3 Ecological Investigation Levels

Ecological investigation levels (EIL) and added contaminant limits (ACL), where appropriate, have been derived in NEPC (2013) for arsenic, copper, chromium (III), nickel, lead, zinc, DDT and naphthalene. The adopted EIL, derived using the interactive (excel) calculation spreadsheet on the NEPM toolbox website are shown in Table 6, with inputs into their derivation shown in Table 5.

Table 5: Inputs to the Derivation of the Ecological Investigation Levels

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	7.3	12 samples were tested for pH as part of the current DSI. 10 samples were tested as part of the previous investigation (DP2020). The average pH value has been used as an initial screening. The pH value adopted is a pH of 7.3.
CEC	15.4 $cmol_c/kg$	Three selected samples were tested for CEC as part of the current DSI and three were tested in the previous investigation (DP2020). The average CEC value has been used as an initial screening. The CEC value adopted is 15.4 $cmol_c/kg$.
Clay content	10%	Conservative value for initial screening
Traffic volumes	High	The site is considered to be located within a high traffic area
State / Territory	NSW	-

Table 6: Ecological Investigation Levels (mg/kg)

Contaminant	EIL-A-B-C
Metals	
Arsenic	100
Copper	230
Nickel	230
Chromium III	410

Contaminant	EIL-A-B-C
Lead	1100
Zinc	690
PAH	
Naphthalene	170
OCP	
DDT	180

F2.4 Ecological Screening Levels

Ecological screening levels (ESL) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. The adopted ESL are shown in Table7.

Table7: Ecological Screening Levels (mg/kg)

Contaminant	Soil Type	ESL-A-B-C
Benzene	Fine	65
Toluene	Fine	105
Ethylbenzene	Fine	125
Xylenes	Fine	45
TRH F1	Coarse/ Fine	180*
TRH F2	Coarse/ Fine	120*
TRH F3	Fine	1300
TRH F4	Fine	5600
B(a)P	Fine	0.7

Notes: ESL are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability
TRH F1 is TRH C_6-C_{10} minus BTEX
TRH F2 is TRH >C_{10}-C_{16} including naphthalene

F2.5 Management Limits

In addition to appropriate consideration and application of the HSL and ESL, 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;
- Effects on buried infrastructure e.g.: penetration of, or damage to, in-ground services.

The adopted management limits are in Table8.

Table 8: Management Limits (mg/kg)

Contaminant	Soil Type	ML-A-B-C
TRH F1	Fine	800
TRH F2	Fine	1000
TRH F3	Fine	3500
TRH F4	Fine	10 000

Notes: TRH F1 is TRH C_6-C_{10} including BTEX
TRH F2 is TRH >C_{10}-C_{16} including naphthalene

F3.0 References

CRC CARE. (2011). *Health screening levels for petroleum hydrocarbons in soil and groundwater.* Parts 1 to 3, Technical Report No. 10: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

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Appendix G

Summary of Laboratory Results

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Table G1: 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
BH201	0.2 m	29-Jun-21	9	<0.4	16	14	15	<0.1	7	26	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
BH201	0.5 m	29-Jun-21	6	<0.4	7	22	12	<0.1	13	50	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
BH202	0.2 m	29-Jun-21	7	<0.4	13	12	12	<0.1	5	25	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
BH203	0 - 0.1 m	29-Jun-21	6	<0.4	11	6	11	<0.1	4	20	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
BH203	0.5 - 0.6 m	29-Jun-21	6	<0.4	11	11	11	<0.1	4	19	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
BH204	0.4 - 0.5 m	29-Jun-21	7	<0.4	10	18	14	<0.1	6	34	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
BH205	0.1 m	29-Jun-21	<4	<0.4	10	41	8	<0.1	7	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	2.2	3.1	22
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	6	170	-	0.7	3	-	300	-
BH206	0 - 0.1 m	29-Jun-21	7	<0.4	12	12	15	<0.1	6	27	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
BD2/20210629	0 m	29-Jun-21	6	<0.4	10	9	12	<0.1	4	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
BH206	0.4 - 0.5 m	29-Jun-21	4	<0.4	6	10	8	<0.1	6	31	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
BH206	0.5 - 0.6 m	29-Jun-21	5	<0.4	7	20	13	<0.1	23	67	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
BH207	0 - 0.1 m	29-Jun-21	5	<0.4	9	5	10	<0.1	4	15	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
BD1/20210629	0 m	29-Jun-21	8	<0.4	12	9	10	<0.1	3	19	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
BH207	0.4 - 0.5 m	29-Jun-21	5	<0.4	8	16	9	<0.1	13	40	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
BH208	0.4 - 0.5 m	29-Jun-21	7	<0.4	15	18	13	<0.1	17	54	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
BH208 - [TRIPLICATE]	0.4 - 0.5 m	29-Jun-21	6	<0.4	10	17	12	<0.1	8	25	"	"	"	"	"	"	"	"	"	"	"	"	"	"
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
107	0.1 - 0.2 m	01/08/2020	10	<0.4	16	15	21	<0.1	6	35	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
107	0.25 - 0.35 m	01/08/2020	8	<0.4	14	10	11	<0.1	3	16	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
108	0.4 - 0.5 m	01/08/2020	10	<0.4	10	14	12	<0.1	5	35	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
108	0.9 - 1 m	01/08/2020	7	<0.4	8	29	15	<0.1	15	56	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
109	0 - 0.1 m	01/08/2020	8	<0.4	15	12	19	<0.1	7	41	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
109	0.2 - 0.3 m	01/08/2020	9	<0.4	15	8	14	<0.1	4	16	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
109	0.6 - 0.7 m	01/08/2020	5	<0.4	9	22	12	<0.1	16	44	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
123	0 - 0.1 m	01/08/2020	7	<0.4	15	13	17	<0.1	6	27	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	**0.06**	<0.5	**0.3**
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-
BD120200801	0 m	01/08/2020	5	<0.4	12	18	20	<0.1	7	38	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100	100	20	-	100	410	6000	230	300	1100	40	-	400	230	7400	690	-	-	-	50	180	280	120	1300	-	5600	0.7	65	480	105	NL	125	110	45	5	170	-	0.7	3	-	300	-

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, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Management Limit DC = Direct Contact HSL

Notes:

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

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

SAC based on generic land use thresholds for Residential A with garden/accessible soil

HIL A Residential / Low - High Density (NEPC, 2013)

HSL A/B Residential / Low - High Density (vapour intrusion) (NEPC, 2013)

DC HSL A Direct contact HSL A Residential (Low density) (direct contact) (CRC CARE, 2011)

EIL/ESL UR/POS Urban Residential and Public Open Space (NEPC, 2013)

ML R/P/POS Residential, Parkland and Public Open Space (NEPC, 2013)

Douglas Partners
Geotechnics / Environment / Groundwater

Table G2: Summary of Laboratory Results – Phenol, OCP, OPP, PCB, Asbestos

			Phenol	OCP												OPP	PCB								ASBESTOS
			Phenol	DDD	DDT+DDE+DDD [c]	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyriphos	Aroclor 1016	Total PCB	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Asbestos (60 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	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	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	
BH201	0.2 m	29-Jun-21	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
BH201	0.5 m	29-Jun-21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
BH202	0.2 m	29-Jun-21	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
BH203	0 - 0.1 m	29-Jun-21	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
BH203	0.5 - 0.6 m	29-Jun-21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
BH204	0.4 - 0.5 m	29-Jun-21	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
BH205	0.1 m	29-Jun-21	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
BH206	0 - 0.1 m	29-Jun-21	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
BD2/20210629	0 m	29-Jun-21	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
BH206	0.4 - 0.5 m	29-Jun-21	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
BH206	0.5 - 0.6 m	29-Jun-21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
BH207	0 - 0.1 m	29-Jun-21	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
BD1/20210629	0 m	29-Jun-21	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
BH207	0.4 - 0.5 m	29-Jun-21	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
BH208	0.4 - 0.5 m	29-Jun-21	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
BH208 - [TRIPLICATE]	0.4 - 0.5 m	29-Jun-21	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	NT
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
107	0.1 - 0.2 m	01/08/2020	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
107	0.25 - 0.35 m	01/08/2020	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	NT
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
108	0.4 - 0.5 m	01/08/2020	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
108	0.9 - 1 m	01/08/2020	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
109	0 - 0.1 m	01/08/2020	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
109	0.2 - 0.3 m	01/08/2020	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
109	0.6 - 0.7 m	01/08/2020	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	NT
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
123	0 - 0.1 m	01/08/2020	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	
BD120200801	0 m	01/08/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
			100	-	240	180	-	180	6	50	10	270	6	10	300	160	-	1	-	-	-	-	-	

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, refer to the lab report Blue = DC exceedance HSL 0-<1 Exceedance

Bold = Lab detections - = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable NL = Non limiting AD = Asbestos detected NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Management Limit DC = Direct Contact HSL

Notes:

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

Site Assessment Criteria (SAC):

Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:

SAC based on generic land use thresholds for Residential A with garden/accessible soil

HIL A	Residential / Low - High Density (NEPC, 2013)
HSL A/B	Residential / Low - High Density (vapour intrusion) (NEPC, 2013)
DC HSL A	Direct contact HSL A Residential (Low density) (direct contact) (CRC CARE, 2011)
EIL/ESL UR/POS	Urban Residential and Public Open Space (NEPC, 2013)
ML R/P/POS	Residential, Parkland and Public Open Space (NEPC, 2013)

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Table G3: Preliminary Waste Classification Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos

			Metals									TRH		BTEX						PAH																Phenol	OCP		OPP	PCB										Asbestos	
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Mercury (organic)	TRH C6 - C10 minus BTEX (F1)	TRH >C10 - C16 minus Naphthalene (F2)	Benzene	Toluene	Ethylbenzene	meta- & para-Xylene	ortho-Xylene	Total Xylenes	Benzo(a)pyrene TEQ	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b)fluoranthene	Benzo(k)fluoranthene	Benzo(j)fluoranthene	Benzo(g,h,i)perylene	Indeno(1,2,3-c,d)pyrene	Dibenz(a,h)anthracene	Total PAH	Phenol	Total Chlordane	Total Aldrin and DDT	Total Analysed OPP	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Total PCB	Asbestos ID in materials	Total Asbestos
		PQL	4	0.4	1	1	1	0.1	1	1		25	50	0.2	0.5	1	2	1	3	0.05	0.001	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.05	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0
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/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-
BH001	0.2 m	29-Jun-21	9	<0.4	16	14	15	<0.1	7	26		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<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	-	NT
BH001	0.5 m	29-Jun-21	6	<0.4	7	22	12	<0.1	13	50		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	NT
BH002	0.2 m	29-Jun-21	7	<0.4	13	12	12	<0.1	5	25		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<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	-	NT
BH003	0 - 0.1 m	29-Jun-21	6	<0.4	11	6	11	<0.1	6	20		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<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	-	NT
BH003	0.5 - 0.6 m	29-Jun-21	6	<0.4	11	11	11	<0.1	4	19		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	NT
BH004	0.2 - 0.3 m	29-Jun-21	7	<0.4	10	16	14	<0.1	6	34		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<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	-	NT
BH005	0.1 m	29-Jun-21	<3	<0.4	10	41	9	<0.1	7	21		<25	<50	<0.2	<0.5	<1	<2	<1	<3	2.2	<0.001	<0.1	0.2	0.5	1.9	1.2	1.9	1.7	0.2	1.5	<0.1	1.4	<1	1.5	1.0	22	<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	-	NT
BH006	0 - 0.1 m	29-Jun-21	7	<0.4	12	12	15	<0.1	6	27		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<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	NT	NT
602072219629	0 m	29-Jun-21	6	<0.4	14	9	12	<0.1	4	21		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-
BH006	0.4 - 0.5 m	29-Jun-21	4	<0.4	6	10	8	<0.1	6	31		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<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	-	NT
BH006	0.9 - 0.9 m	29-Jun-21	5	<0.4	7	20	13	<0.1	22	57		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	NT
BH007	0 - 0.1 m	29-Jun-21	5	<0.4	9	5	10	<0.1	4	16		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<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	NT	NT
602072219629	0 m	29-Jun-21	6	<0.4	12	9	10	<0.1	3	16		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-
BH007	0.4 - 0.5 m	29-Jun-21	5	<0.4	8	16	9	<0.1	13	40		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<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	-	NT
BH008	0.2 - 0.3 m	29-Jun-21	7	<0.4	15	18	13	<0.1	17	53		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<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	-	NT
BH008 - Lower (Fibre of ACM)	0.4 - 0.5 m	29-Jun-21	6	<0.4	10	17	12	<0.1	6	25		-	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
101	0.1 - 0.2 m	010900/20	10	<0.4	16	15	21	<0.1	6	35		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<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	-	NT
107	0.25 - 0.35 m	010900/20	8	<0.4	14	10	11	<0.1	3	16		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
108	0.4 - 0.5 m	010900/20	10	<0.4	15	14	12	<0.1	5	35		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<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	-	NT
108	0.9 - 1 m	010900/20	7	<0.4	8	29	15	<0.1	15	56		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<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	-	NT
109	0 - 0.1 m	010900/20	8	<0.4	14	12	19	<0.1	7	41		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<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	-	NT
109	0.2 - 0.3 m	010900/20	9	<0.4	15	8	14	<0.1	4	36		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<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	-	NT
109	0.6 - 0.7 m	010900/20	5	<0.4	9	22	12	<0.1	19	46		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
122	0 - 0.1 m	010900/20	7	<0.4	14	13	17	<0.1	6	47		<25	<50	<0.2	<0.5	<1	<2	<1	<3	0.06		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	1.2	<5	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NT	NT
602120036803	0 m	010900/20	5	<0.4	12	18	20	<0.1	7	38		<25	<50	<0.2	<0.5	<1	<2	<1	<3	<0.05		<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-
Waste Classification Criteria																																																		
CT1			100	20	100	NC	100	4	40	NC		650	10000	10	288	600	NC	NC	1000	0.8		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	200	288	50	<50	4	NC	NC	NC	NC	NC	NC	NC	NC	<50	NC	NC
SCC1			500	100	1900	NC	1900	50	1050	NC		650	10000	18	518	1080	NC	NC	1800	10		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	200	518	168	<50	7.6	NC	NC	NC	NC	NC	NC	NC	NC	<50	NC	NC
TCLP1			NA	NA	NA	NC	NA	NA	NA	NC		NA	NA	NA	NA	NC	NC	NC	NA	NA	0.01	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NA	NC	NC
CT2			400	80	400	NC	400	16	160	NC		2600	40000	40	1152	2400	NC	NC	4000	3.2		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	800	1152	240	<50	14	NC	NC	NC	NC	NC	NC	NC	NC	<50	NC	NC
SCC2			2000	400	7600	NC	6000	200	4200	NC		2600	40000	72	2073	4320	NC	NC	7200	20		NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	800	2073	432	<50	30	NC	NC	NC	NC	NC	NC	NC	NC	<50	NC	NC
TCLP2			NA	NA	NA	NC	NA	NA	NA	NC		NA	NA	NA	NA	NC	NC	NC	NA	NA	0.04	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NC	NA	NA	NA	NA	NA	NC	NC	NC	NC	NC	NC	NC	NC	NA	NC	NC

CT1 exceedance | TCLP1 and/or SCC1 exceedance | CT2 exceedance | TCLP2 and/or SCC2 exceedance | Asbestos detection

NT = Not tested NL = Non limiting NC = No criteria NA = Not applicable

Notes:

a QA/QC replicate of sample listed directly below the primary sample

b Total chromium used as initial screen for chromium(VI).

c Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH).

d Criteria for scheduled chemicals used as an initial screen

e Criteria for Chlorpyrifos used as initial screen

f All criteria are in the same units as the reported results.

PQL Practical quantitation limit

CT1 NSW EPA, 2014, Waste Classification Guidelines Part 1: Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste

SCC1 NSW EPA, 2014, Waste Classification Guidelines Part 1: Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

TCLP1 NSW EPA, 2014, Waste Classification Guidelines Part 1: Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste

CT2 NSW EPA, 2014, Waste Classification Guidelines Part 1: Classifying Waste, Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste

SCC2 NSW EPA, 2014, Waste Classification Guidelines Part 1: Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

TCLP2 NSW EPA, 2014, Waste Classification Guidelines Part 1: Classifying Waste, Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

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Table R1: 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
101	0.1 - 0.2 m	02/08/2020	<4	<0.4	12	36	10	<0.1	26	51	<25	<50	<25	<50	130	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
101	0.4 - 0.5 m	02/08/2020	10	<0.4	8	14	6	<0.1	4	15	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
102	0 - 0.1 m	02/08/2020	6	<0.4	9	21	12	<0.1	12	50	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
102	0.2 - 0.3 m	02/08/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
103	0 - 0.15 m	02/08/2020	<4	<0.4	10	23	13	<0.1	9	52	<25	<50	<25	<50	<100	150	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
104	0 - 0.1 m	02/08/2020	6	<0.4	12	36	38	<0.1	9	110	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
104	0.2 - 0.3 m	02/08/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
105	0 - 0.12 m	01/08/2020	9	<0.4	14	9	18	<0.1	4	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
105	0.15 - 0.25 m	01/08/2020	6	<0.4	4	5	5	<0.1	<1	7	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
106	0.05 - 0.15 m	01/08/2020	7	<0.4	13	7	15	<0.1	4	15	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
106	0.15 - 0.25 m	01/08/2020	10	<0.4	17	13	12	<0.1	3	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
107	0.1 - 0.2 m	01/08/2020	10	<0.4	16	15	21	<0.1	6	35	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
107	0.25 - 0.35 m	01/08/2020	8	<0.4	14	10	11	<0.1	3	16	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
108	0.4 - 0.5 m	01/08/2020	10	<0.4	10	14	12	<0.1	5	35	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
108	0.9 - 1 m	01/08/2020	7	<0.4	8	29	15	<0.1	15	56	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
109	0 - 0.1 m	01/08/2020	8	<0.4	15	12	19	<0.1	7	41	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
109	0.2 - 0.3 m	01/08/2020	9	<0.4	15	8	14	<0.1	4	16	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
109	0.6 - 0.7 m	01/08/2020	5	<0.4	9	22	12	<0.1	16	44	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
111	0.05 - 0.1 m	01/08/2020	9	<0.4	15	10	13	<0.1	6	25	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
113	0.1 - 0.2 m	01/08/2020	12	<0.4	11	12	11	<0.1	5	25	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
113	0.5 - 0.6 m	01/08/2020	11	<0.4	20	6	10	<0.1	4	14	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
114	0.3 - 0.4 m	01/08/2020	11	<0.4	18	6	11	<0.1	6	27	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
115	0 - 0.1 m	01/08/2020	<4	<0.4	10	20	16	<0.1	10	53	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
115	0.2 - 0.3 m	01/08/2020	8	<0.4	14	8	11	<0.1	5	20	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
115	0.5 - 0.6 m	01/08/2020	9	<0.4	13	5	10	<0.1	2	15	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC
116	0 - 0.1 m	01/08/2020	6	<0.4	11	15	13	<0.1	7	35	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<1	<0.05	<0.5	<0.05
			100 100	20 NC	100 410	6000 210	300 1100	40 NC	400 190	7400 520	NC NC	NC NC	45 180	110 120	NC 300	NC 2800	0.5 50	160 85	55 70	40 105	3 170	NC 0.7	3 NC	300 NC

117	0 - 0.03 m	01/08/2020	10 100 100	<0.4 20 NC	13 100 410	15 6000 210	12 300 1100	<0.1 40 NC	8 400 190	36 7400 520	<25 NC NC	<50 NC NC	<25 45 180	<50 110 120	<100 NC 300	<100 NC 2800	<0.2 0.5 50	<0.5 160 85	<1 55 70	<1 40 105	<1 3 170	<0.05 NC 0.7	<0.5 3 NC	<0.05 300 NC
118	0.05 - 0.1 m	01/08/2020	10 100 100	<0.4 20 NC	14 100 410	16 6000 210	12 300 1100	<0.1 40 NC	6 400 190	30 7400 520	<25 NC NC	<50 NC NC	<25 45 180	<50 110 120	<100 NC 300	<100 NC 2800	<0.2 0.5 50	<0.5 160 85	<1 55 70	<1 40 105	<1 3 170	<0.05 NC 0.7	<0.5 3 NC	<0.05 300 NC
BD2/20200801	0.05 - 0.1 m	01/08/2020	9 100 100	<0.4 20 NC	13 100 410	15 6000 210	12 300 1100	<0.1 40 NC	6 400 190	30 7400 520	<25 NC NC	<50 NC NC	<25 45 180	<50 110 120	<100 NC 300	<100 NC 2800	<0.2 0.5 50	<0.5 160 85	<1 55 70	<1 40 105	<1 3 170	<0.05 NC 0.7	<0.5 3 NC	<0.05 300 NC
118	0.2 - 0.3 m	01/08/2020	7 100 100	<0.4 20 NC	4 100 410	23 6000 210	12 300 1100	<0.1 40 NC	5 400 190	28 7400 520	<25 NC NC	<50 NC NC	<25 45 180	<50 110 120	<100 NC 300	<100 NC 2800	<0.2 0.5 50	<0.5 160 85	<1 55 70	<1 40 105	<1 3 170	<0.05 NC 0.7	<0.5 3 NC	<0.05 300 NC
119	0 - 0.5 m	02/08/2020	5 100 100	<0.4 20 NC	10 100 410	44 6000 210	13 300 1100	<0.1 40 NC	8 400 190	38 7400 520	<25 NC NC	<50 NC NC	<25 45 180	<50 110 120	<100 NC 300	<100 NC 2800	<0.2 0.5 50	<0.5 160 85	<1 55 70	<1 40 105	<1 3 170	<0.05 NC 0.7	<0.5 3 NC	<0.05 300 NC
119	0.2 - 0.3 m	02/08/2020	4 100 100	<0.4 20 NC	8 100 410	10 6000 210	10 300 1100	<0.1 40 NC	5 400 190	22 7400 520	<25 NC NC	<50 NC NC	<25 45 180	<50 110 120	<100 NC 300	<100 NC 2800	<0.2 0.5 50	<0.5 160 85	<1 55 70	<1 40 105	<1 3 170	<0.05 NC 0.7	<0.5 3 NC	<0.05 300 NC
119	0.6 - 0.7 m	02/08/2020	9 100 100	<0.4 20 NC	23 100 410	7 6000 210	9 300 1100	<0.1 40 NC	4 400 190	13 7400 520	<25 NC NC	<50 NC NC	<25 45 180	<50 110 120	<100 NC 300	<100 NC 2800	<0.2 0.5 50	<0.5 160 85	<1 55 70	<1 40 105	<1 3 170	<0.05 NC 0.7	<0.5 3 NC	<0.05 300 NC
120	0 - 0.1 m	02/08/2020	4 100 100	<0.4 20 NC	10 100 410	22 6000 210	13 300 1100	<0.1 40 NC	9 400 190	56 7400 520	<25 NC NC	<50 NC NC	<25 45 180	<50 110 120	<100 NC 300	<100 NC 2800	<0.2 0.5 50	<0.5 160 85	<1 55 70	<1 40 105	<1 3 170	<0.05 NC 0.7	<0.5 3 NC	<0.05 300 NC
120	0.2 - 0.3 m	02/08/2020	8 100 100	<0.4 20 NC	13 100 410	17 6000 210	12 300 1100	<0.1 40 NC	6 400 190	27 7400 520	<25 NC NC	<50 NC NC	<25 45 180	<50 110 120	<100 NC 300	<100 NC 2800	<0.2 0.5 50	<0.5 160 85	<1 55 70	<1 40 105	<1 3 170	<0.05 NC 0.7	<0.5 3 NC	<0.05 300 NC
121	0 - 0.1 m	02/08/2020	5 100 100	<0.4 20 NC	11 100 410	24 6000 210	19 300 1100	<0.1 40 NC	10 400 190	62 7400 520	<25 NC NC	<50 NC NC	<25 45 180	<50 110 120	160 NC 300	230 NC 2800	<0.2 0.5 50	<0.5 160 85	<1 55 70	<1 40 105	<1 3 170	<0.05 NC 0.7	<0.5 3 NC	<0.05 300 NC
122	0 - 0.1 m	01/08/2020	NT 100 100	NT 20 NC	NT 100 410	NT 6000 210	NT 300 1100	NT 40 NC	NT 400 190	NT 7400 520	NT NC NC	NT NC NC	NT 45 180	NT 110 120	NT NC 300	NT NC 2800	NT 0.5 50	NT 160 85	NT 55 70	NT 40 105	NT 3 170	NT NC 0.7	NT 3 NC	NT 300 NC
122	0.2 - 0.3 m	01/08/2020	NT 100 100	NT 20 NC	NT 100 410	NT 6000 210	NT 300 1100	NT 40 NC	NT 400 190	NT 7400 520	NT NC NC	NT NC NC	NT 45 180	NT 110 120	NT NC 300	NT NC 2800	NT 0.5 50	NT 160 85	NT 55 70	NT 40 105	NT 3 170	NT NC 0.7	NT 3 NC	NT 300 NC
123	0 - 0.1 m	01/08/2020	7 100 100	<0.4 20 NC	15 100 410	13 6000 210	17 300 1100	<0.1 40 NC	6 400 190	27 7400 520	<25 NC NC	<50 NC NC	<25 45 180	<50 110 120	<100 NC 300	<100 NC 2800	<0.2 0.5 50	<0.5 160 85	<1 55 70	<1 40 105	<1 3 170	0.06 NC 0.7	<0.5 3 NC	0.3 300 NC
BD120200801	0 - 0.1 m	01/08/2020	5 100 100	<0.4 20 NC	12 100 410	18 6000 210	20 300 1100	<0.1 40 NC	7 400 190	38 7400 520	<25 NC NC	<50 NC NC	<25 45 180	<50 110 120	<100 NC 300	<100 NC 2800	<0.2 0.5 50	<0.5 160 85	<1 55 70	<1 40 105	<1 3 170	<0.05 NC 0.7	<0.5 3 NC	<0.05 300 NC
124	0 - 0.1 m	01/08/2020	NT 100 100	NT 20 NC	NT 100 410	NT 6000 210	NT 300 1100	NT 40 NC	NT 400 190	NT 7400 520	NT NC NC	NT NC NC	NT 45 180	NT 110 120	NT NC 300	NT NC 2800	NT 0.5 50	NT 160 85	NT 55 70	NT 40 105	NT 3 170	NT NC 0.7	NT 3 NC	NT 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 A (undefined), HSL A/B (undefined), DC HSL A (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 R2: Summary of Laboratory Results – Phenol, OCP, OPP, PCB, Asbestos

			Phenol	OCP												OPP	PCB	Asbestos		
			Phenol	DDT+DDE+DDD c	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	-	-	-
101	0.1 - 0.2 m	02/08/2020	<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	NAD	NAD	NAD
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
101	0.4 - 0.5 m	02/08/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
102	0 - 0.1 m	02/08/2020	<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	NAD	NAD	NAD
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
102	0.2 - 0.3 m	02/08/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NAD	NAD	NAD
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
103	0 - 0.15 m	02/08/2020	<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	NAD	NAD	NAD
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
104	0 - 0.1 m	02/08/2020	<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	NAD	NAD	NAD
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
104	0.2 - 0.3 m	02/08/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NAD	NAD	NAD
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
105	0 - 0.12 m	01/08/2020	<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	NAD	NAD	NAD
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
105	0.15 - 0.25 m	01/08/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
106	0.05 - 0.15 m	01/08/2020	<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	NAD	NAD	NAD
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
106	0.15 - 0.25 m	01/08/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
107	0.1 - 0.2 m	01/08/2020	<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	NAD	NAD	NAD
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
107	0.25 - 0.35 m	01/08/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
108	0.4 - 0.5 m	01/08/2020	<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	NAD	NAD	NAD
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
108	0.9 - 1 m	01/08/2020	<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	NAD	NAD	NAD
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
109	0 - 0.1 m	01/08/2020	<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	NAD	NAD	NAD
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
109	0.2 - 0.3 m	01/08/2020	<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	NAD	NAD	NAD
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
109	0.6 - 0.7 m	01/08/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
111	0.05 - 0.1 m	01/08/2020	<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	NAD	NAD	NAD
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
113	0.1 - 0.2 m	01/08/2020	<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	NAD	NAD	NAD
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
113	0.5 - 0.6 m	01/08/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
114	0.3 - 0.4 m	01/08/2020	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT		NT	NT	NT	NT	NT
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			
115	0 - 0.1 m	01/08/2020	<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	NAD	NAD	NAD
			100 NC	240 180	NC NC	NC NC	NC 180	6 NC	50 NC	270 NC	10 NC	6 NC	10 NC	300 NC		160 NC	1 NC			

115	0.2 - 0.3 m	01/08/2020	<5 100 NC	<0.1 240 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 6 NC	<0.1 50 NC	<0.1 270 NC	<0.1 10 NC	<0.1 6 NC	<0.1 10 NC	<0.1 300 NC	<0.1 160 NC	<0.1 1 NC	NAD	NAD	NAD
115	0.5 - 0.6 m	01/08/2020	NT 100 NC	NT 240 180	NT NC NC	NT NC NC	NT NC 180	NT 6 NC	NT 50 NC	NT 270 NC	NT 10 NC	NT 6 NC	NT 10 NC	NT 300 NC	NT 160 NC	NT 1 NC	NT	NT	NT
116	0 - 0.1 m	01/08/2020	<5 100 NC	<0.1 240 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 6 NC	<0.1 50 NC	<0.1 270 NC	<0.1 10 NC	<0.1 6 NC	<0.1 10 NC	<0.1 300 NC	<0.1 160 NC	<0.1 1 NC	NAD	NAD	NAD
117	0 - 0.03 m	01/08/2020	<5 100 NC	<0.1 240 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 6 NC	<0.1 50 NC	<0.1 270 NC	<0.1 10 NC	<0.1 6 NC	<0.1 10 NC	<0.1 300 NC	<0.1 160 NC	<0.1 1 NC	NAD	NAD	NAD
118	0.05 - 0.1 m	01/08/2020	<5 100 NC	<0.1 240 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 6 NC	<0.1 50 NC	<0.1 270 NC	<0.1 10 NC	<0.1 6 NC	<0.1 10 NC	<0.1 300 NC	<0.1 160 NC	<0.1 1 NC	NAD	NAD	NAD
BD2/20200801	0.05 - 0.1 m	01/08/2020	NT 100 NC	NT 240 180	NT NC NC	NT NC NC	NT NC 180	NT 6 NC	NT 50 NC	NT 270 NC	NT 10 NC	NT 6 NC	NT 10 NC	NT 300 NC	NT 160 NC	NT 1 NC	NT	NT	NT
118	0.2 - 0.3 m	01/08/2020	<5 100 NC	<0.1 240 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 6 NC	<0.1 50 NC	<0.1 270 NC	<0.1 10 NC	<0.1 6 NC	<0.1 10 NC	<0.1 300 NC	<0.1 160 NC	<0.1 1 NC	NAD	NAD	NAD
119	0 - 0.5 m	02/08/2020	<5 100 NC	<0.1 240 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 6 NC	<0.1 50 NC	<0.1 270 NC	<0.1 10 NC	<0.1 6 NC	<0.1 10 NC	<0.1 300 NC	<0.1 160 NC	<0.1 1 NC	NAD	NAD	NAD
119	0.2 - 0.3 m	02/08/2020	<5 100 NC	<0.1 240 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 6 NC	<0.1 50 NC	<0.1 270 NC	<0.1 10 NC	<0.1 6 NC	<0.1 10 NC	<0.1 300 NC	<0.1 160 NC	<0.1 1 NC	NAD	NAD	NAD
119	0.6 - 0.7 m	02/08/2020	NT 100 NC	NT 240 180	NT NC NC	NT NC NC	NT NC 180	NT 6 NC	NT 50 NC	NT 270 NC	NT 10 NC	NT 6 NC	NT 10 NC	NT 300 NC	NT 160 NC	NT 1 NC	NT	NT	NT
120	0 - 0.1 m	02/08/2020	<5 100 NC	<0.1 240 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 6 NC	<0.1 50 NC	<0.1 270 NC	<0.1 10 NC	<0.1 6 NC	<0.1 10 NC	<0.1 300 NC	<0.1 160 NC	<0.1 1 NC	NAD	NAD	NAD
120	0.2 - 0.3 m	02/08/2020	NT 100 NC	NT 240 180	NT NC NC	NT NC NC	NT NC 180	NT 6 NC	NT 50 NC	NT 270 NC	NT 10 NC	NT 6 NC	NT 10 NC	NT 300 NC	NT 160 NC	NT 1 NC	NT	NT	NT
121	0 - 0.1 m	02/08/2020	<5 100 NC	<0.1 240 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 6 NC	<0.1 50 NC	<0.1 270 NC	<0.1 10 NC	<0.1 6 NC	<0.1 10 NC	<0.1 300 NC	<0.1 160 NC	<0.1 1 NC	NAD	NAD	NAD
122	0 - 0.1 m	01/08/2020	NT 100 NC	NT 240 180	NT NC NC	NT NC NC	NT NC 180	NT 6 NC	NT 50 NC	NT 270 NC	NT 10 NC	NT 6 NC	NT 10 NC	NT 300 NC	NT 160 NC	NT 1 NC	NAD	NAD	NAD
122	0.2 - 0.3 m	01/08/2020	NT 100 NC	NT 240 180	NT NC NC	NT NC NC	NT NC 180	NT 6 NC	NT 50 NC	NT 270 NC	NT 10 NC	NT 6 NC	NT 10 NC	NT 300 NC	NT 160 NC	NT 1 NC	NAD	NAD	NAD
123	0 - 0.1 m	01/08/2020	<5 100 NC	<0.1 240 180	<0.1 NC NC	<0.1 NC NC	<0.1 NC 180	<0.1 6 NC	<0.1 50 NC	<0.1 270 NC	<0.1 10 NC	<0.1 6 NC	<0.1 10 NC	<0.1 300 NC	<0.1 160 NC	<0.1 1 NC	NAD	NAD	NAD
BD120200801	0 - 0.1 m	01/08/2020	NT 100 NC	NT 240 180	NT NC NC	NT NC NC	NT NC 180	NT 6 NC	NT 50 NC	NT 270 NC	NT 10 NC	NT 6 NC	NT 10 NC	NT 300 NC	NT 160 NC	NT 1 NC	NT	NT	NT
124	0 - 0.1 m	01/08/2020	NT 100 NC	NT 240 180	NT NC NC	NT NC NC	NT NC 180	NT 6 NC	NT 50 NC	NT 270 NC	NT 10 NC	NT 6 NC	NT 10 NC	NT 300 NC	NT 160 NC	NT 1 NC	NAD	NAD	NAD

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 A (undefined), HSL A/B (undefined), DC HSL A (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

Appendix H

Borehole Logs

BOREHOLE LOG

CLIENT: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 56.2 mAHD
EASTING: 306364.7
NORTHING: 6268242.3
DIP/AZIMUTH: 90°/--

BORE No: 103
PROJECT No: 94624.00
DATE: 2/8/2020
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)
56	0.05	FILL / TOPSOIL: Silty CLAY: brown, trace fine gravel and rootlets, w > PL, surficial vegetation		D/E	0.0–0.05				
		FILL / Silty CLAY CH: grey-brown, with fine to coarse siltstone gravel, trace sand, w < PL, appears generally moderately-well compacted		D	0.1				
				D/E	0.2–0.3				
				D	0.4–0.5				
	0.6	Silty CLAY CH: high plasticity, pale brown and red-brown, w < PL, stiff, residual							
55	1	1.0m: becoming pale grey mottled orange		D	0.9–1.0				
				S	1.45		6,7,8 N = 15		
	1.5	Silty CLAY CH: medium to high plasticity, pale grey and orange-brown, with bands of very low strength siltstone, w < PL, very stiff, residual		D	1.5–1.6				
	2	2.0 Bore discontinued at 2.0m		D	1.9–2.0				
54	3								
53	4								
52									

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased

TYPE OF BORING: 150mm diameter SFA

WATER OBSERVATIONS: No free ground water 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

BOREHOLE LOG

CLIENT: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 57.2 mAHD
EASTING: 306407.1
NORTHING: 6268256.3
DIP/AZIMUTH: 90°/--

BORE No: 104
PROJECT No: 94624.00
DATE: 2/8/2020
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)
57	0.1	FILL / TOPSOIL: Silty CLAY CH: brown, trace fine gravel and rootlets, w > PL, surficial vegetation		D/E	0.0 – 0.1				
		FILL / Silty CLAY CH: medium to high plasticity, brown and red-brown, w > PL, appears generally poorly compacted		D/E	0.1 – 0.2				
	0.5	Silty CLAY CH: medium to high plasticity, pale brown and red-brown, w < PL, stiff, residual			0.2 – 0.3				
56	1	- becoming very stiff below 0.9m		S	1.0 – 1.3		3,20 refusal		1
	1.4	Silty CLAY CH: medium to high plasticity, pale grey and orange-brown, with very low strength siltstone bands, w < PL, hard, residual							
55	2	SILTSTONE: grey, very low strength, moderately weathered, Ashfield Shale		S	2.0 – 2.2		11,15/60 refusal 15/60mm refusal		2
	2.5	Bore discontinued at 2.5m		D	2.4 – 2.5				
54	3								3
53	4								4

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased

TYPE OF BORING: 150mm diameter SFA

WATER OBSERVATIONS: No free ground water 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

BOREHOLE LOG

CLIENT: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 58.5 mAHD
EASTING: 306494.7
NORTHING: 6268314.9
DIP/AZIMUTH: 90°/--

BORE No: 105
PROJECT No: 94624.00
DATE: 1/8/2020
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)
58	0.12	FILL / TOPSOIL: Silty CLAY CL - CI: low to medium plasticity, dark brown, with rootlets, trace igneous gravel, fine sand, w < PL		A/E	0.0		< 1.0 pp		
				A/E	0.12 0.15		1.0 pp		
	0.35	Silty CLAY CI-CH: medium to high plasticity, red-brown, trace fine ironstone gravel, trace rootlets, stiff, residual			0.25				
		0.25m: pale grey and red-brown, with fine sandstone and ironstone gravel, trace fine sand		D	0.4 0.5				
		SILTSTONE: grey-brown, very low strength, moderately weathered, with clay seams, Ashfield Shale							
	1			D	0.9 1.0				1
					1.4				
57	1.5			D	1.5				
		Bore discontinued at 1.5m							
	2								2
56									
	3								3
55									
	4								4
54									

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY/KR **CASING:** Uncased

TYPE OF BORING: 150mm diameter SFA

WATER OBSERVATIONS: No free ground water 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

BOREHOLE LOG

CLIENT: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 58.5 mAHD
EASTING: 306487.3
NORTHING: 6268317.4
DIP/AZIMUTH: 90°/--

BORE No: 106
PROJECT No: 94624.00
DATE: 1/8/2020
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)
58	0.15	FILL / TOPSOIL: Silty CLAY CL-CI: low to medium plasticity, dark brown, with rootlets, trace igneous gravel, fine sand, w < PL		A/E	0.05 0.1		1.3 pp		
				A/E	0.15 0.25		1.1 pp		
		Silty CLAY CI-CH: medium to high plasticity, red-brown, trace rootlets, fine ironstone gravel, w <PL, stiff, residual 0.35m: pale grey and red-brown		A/E	0.4		1.3 pp		
	0.5	Silty CLAY CH: medium to high plasticity, pale grey mottled orange-brown, trace sand, trace ironstone gravel, w < PL, hard, residual			0.5				
57	1.0	SILTSTONE: grey, very low to low strength, moderately weathered, Ashfield Shale		S	1.0 1.45		20,24,25 N = 49		
	2.0	Bore discontinued at 2.0m							
56									
55									
54									

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY/KR **CASING:** Uncased

TYPE OF BORING: 150mm diameter SFA

WATER OBSERVATIONS: No free ground water 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: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 58.6 mAHD
EASTING: 306513.2
NORTHING: 6268364.9
DIP/AZIMUTH: 90°/--

BORE No: 107
PROJECT No: 94624.00
DATE: 1/8/2020
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)
58	0.08	FILL / TOPSOIL:Silty CLAY CL-CI: low to medium plasticity, trace rootlets, fine igneous gravel, w < PL			0.1		< 1.0 pp		
	0.2	FILL / Silty CLAY CH: medium to high plasticity, yellow-brown and dark brown, trace rootlets		A/E	0.2				
	0.4	Silty CLAY CI-CH: medium to high plasticity, red-brown, w < PL, stiff, residual		A/G	0.25		1.5 pp		
		Silty CLAY CH: medium to high plasticity, mottled red-brown and grey, w < PL, firm, residual			0.35				
	1								1
57		Silty Clay CI-CH: medium to high plasticity, pale grey and orange, trace ironstone gravel, w < PL, very stiff, residual			1.0				
					1.45				
	2	2.0 SILTSTONE: grey-brown, very low strength, moderately weathered, Ashfield Shale							2
56									
	3	3.0 Bore discontinued at 3.0m							3
55									
	4								4
54									

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY/KR **CASING:** Uncased

TYPE OF BORING: 150mm diameter SFA

WATER OBSERVATIONS: No free ground water 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

BOREHOLE LOG

CLIENT: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 58.7 mAHD
EASTING: 306501.7
NORTHING: 6268423.3
DIP/AZIMUTH: 90°/--

BORE No: 108
PROJECT No: 94624.00
DATE: 1/8/2020
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)
58	0.1	FILL / TOPSOIL: Silty CLAY CH: brown, with fine to medium sand and fine to medium siltstone gravel, trace rootlets, w > PL, surficial vegetation			0.0				
					0.1				
					0.2				
					0.3				
	0.4	FILL / Silty CLAY CH: brown, with gravel, trace sand, w < PL, appears variably compacted			0.4				
		FILL / Silty CLAY CH: grey, orange and brown, with sand and siltstone gravel, w < PL, generally moderately-well compacted		D	0.5				
	1								1
				D	0.9				
					1.0				
				S			7,7,10 N = 17		
					1.45				
				D	1.5				
57					1.6				
				D	1.9				
	2	2.0			2.0				2
		Bore discontinued at 2.0m							
56	3								3
55	4								4
54									

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased

TYPE OF BORING: 150mm diameter SFA

WATER OBSERVATIONS: No free ground water 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: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 59.1 mAHD
EASTING: 306521
NORTHING: 6268420.1
DIP/AZIMUTH: 90°/--

BORE No: 109
PROJECT No: 94624.00
DATE: 1/8/2020
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)
59	0.1	FILL / TOPSOIL: Silty CLAY CH: brown, with fine to medium sand and fine to medium siltstone gravel, trace rootlets, w > PL, surficial vegetation		D/E	0.0 – 0.1				
		FILL / Silty CLAY CH: brown, trace fine to coarse siltstone, w > PL, variably compacted		D/E	0.2 – 0.3				
	0.6	Silty CLAY CH: medium to high plasticity, pale brown and grey, trace fine gravel, w < PL, stiff to very stiff, residual		D/E	0.6 – 0.7				
58	1			S	1.0		7,9,11 N = 20		1
	1.4	SILTSTONE: grey, very low to low strength, moderately weathered, with clay seams, Ashfield Shale			1.45				
	2.0	Bore discontinued at 2.0m							2
57	2								
56	3								3
55	4								4

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased
TYPE OF BORING: 150mm diameter SFA
WATER OBSERVATIONS: No free ground water 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: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 58.0 mAHD
EASTING: 306446.3
NORTHING: 6268255.9
DIP/AZIMUTH: 90°/--

BORE No: 110
PROJECT No: 94624.00
DATE: 2/8/2020
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
58	0.02	ASPHALTIC CONCRETE							
		FILL / ROADBASE: Sandy GRAVEL: grey-brown, fine to coarse grained sand and fine to coarse igneous gravel, dry		D/E	0.1				
				D/E	0.2				
					0.3				
	0.4	Silty Clay CH: medium to high plasticity, pale brown, with very low strength siltstone bands, w < PL, very stiff, residual		D	0.4				
					0.5				
	0.8	SILTSTONE: grey-brown, very low strength, moderately weathered, with clay seams, Ashfield Shale							
57	1			D	0.9				1
				S	1.0		20/80mm refusal		
					1.08				
				D	1.4				
					1.5				
	1.7	Bore discontinued at 1.7m							
56	2								2
55	3								3
54	4								4

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased
TYPE OF BORING: 150mm diameter SFA
WATER OBSERVATIONS: No free ground water 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: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 58.2 mAHD
EASTING: 306445.8
NORTHING: 6268264.4
DIP/AZIMUTH: 90°/--

BORE No: 111
PROJECT No: 94624.00
DATE: 1/8/2020
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)
58	0.05	FILL / TOPSOIL: Silty CLAY CL-CI: low to medium plasticity, dark brown, with rootlets, trace fine sandstone gravel, fine sand, w < PL		A/E	0.05 0.1		< 1.0 pp		
		FILL / Silty CLAY CI: medium plasticity, yellow, red and brown, with fine to medium sandstone and ironstone gravel, w < PL		A/E	0.2 0.3		< 1.0 pp		
	0.4				0.45				
	0.55	Silty CLAY CI-CH: medium to high plasticity, red-brown, w < PL, stiff, residual		A/E	0.55		< 1.0 pp		
		Bore discontinued at 0.55m							
57	1								1
56	2								2
55	3								3
54	4								4

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RIG: Hand Tools **DRILLER:** KR **LOGGED:** KR **CASING:** Uncased

TYPE OF BORING: Hand Auger (100mm) to 0.55m

WATER OBSERVATIONS: No free ground water observed whilst augering

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: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 58.0 mAHD
EASTING: 306437.6
NORTHING: 6268239.1
DIP/AZIMUTH: 90°/--

BORE No: 112
PROJECT No: 94624.00
DATE: 1/8/2020
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)
58	0.25	FILL / Silty CLAY CI: medium plasticity, brown and dark brown, trace fine sandstone gravel, w ~ PL, 50mm bark cover		A/E	0.08 0.15		< 1.0 pp		
	0.5	FILL / Silty CLAY CI: medium plasticity, yellow, red and brown, with fine to medium sandstone and ironstone gravel, w < PL, appears variably compacted		A/E	0.25 0.35		< 1.0 pp		
	0.6	Silty CLAY CI-CH: medium to high plasticity, red-brown, w < PL, stiff to very stiff, residual		A/E	0.5 0.6		< 1.0 pp		
		Bore discontinued at 0.6m							
57	1								1
56	2								2
55	3								3
54	4								4

Dynamic Penetrometer Test (blows per 150mm): 5, 10, 15, 20

RIG: Hand Tools **DRILLER:** KR **LOGGED:** KR **CASING:** Uncased

TYPE OF BORING: Hand Auger (100mm) to 0.6m

WATER OBSERVATIONS: No free ground water observed whilst augering

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: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 57.4 mAHD
EASTING: 306417.1
NORTHING: 6268244.1
DIP/AZIMUTH: 90°/--

BORE No: 113
PROJECT No: 94624.00
DATE: 1/8/2020
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)
57	0.05	FILL / TOPSOIL: Silty CLAY CL-CI: low to medium plasticity, dark brown, with rootlets, trace fine sandstone gravel, fine sand, w < PL							
	0.2	FILL / Silty CLAY CI: medium plasticity, yellow, red and brown, trace fine sandstone gravel, w < PL		A/E	0.1		< 1.0 pp		
	0.45	FILL / Silty CLAY CI: medium plasticity, brown and dark brown, trace fine sandstone gravel, w ~ PL		A/E	0.2		< 1.0 pp		
	0.6	Silty CLAY CI-CH: medium to high plasticity, red-brown, w < PL, stiff to very stiff, residual		A/E	0.4		< 1.0 pp		
		Bore discontinued at 0.6m			0.5				
					0.6				

RIG: Hand Tools **DRILLER:** KR **LOGGED:** KR **CASING:** Uncased

TYPE OF BORING: Hand Auger (100mm) to 0.6m

WATER OBSERVATIONS: No free ground water observed whilst augering

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: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 57.5 mAHD
EASTING: 306418.4
NORTHING: 6268254.1
DIP/AZIMUTH: 90°/--

BORE No: 114
PROJECT No: 94624.00
DATE: 1/8/2020
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
	0.05	FILL / TOPSOIL: Silty CLAY: low to medium plasticity, dark brown, with rootlets, fine sandstone gravel, fine sand, w < PL		A/E	0.05 0.15		< 1.0 pp		
	0.27	FILL / Silty CLAY CI: medium plasticity, brown, grey and red, trace fine sandstone gravel, w < PL		A/E	0.3		< 1.0 pp		
57	0.4	Silty CLAY CI-CH: medium to high plasticity, red-brown, w < PL, stiff to very stiff, residual			0.4				
		Bore discontinued at 0.4m							
	1								1
56									
	2								2
55									
	3								3
54									
	4								4
53									

RIG: Hand Tools **DRILLER:** KR **LOGGED:** KR **CASING:** Uncased

TYPE OF BORING: Hand Auger (100mm) to 0.4m

WATER OBSERVATIONS: No free ground water observed whilst augering

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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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 57.3 mAHD
EASTING: 306408.7
NORTHING: 6268277.3
DIP/AZIMUTH: 90°/--

BORE No: 115
PROJECT No: 94624.00
DATE: 1/8/2020
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
57	0.12	FILL / TOPSOIL: Silty CLAY CH: brown, trace fine gravel and rootlets, w > PL, surficial vegetation		D/E	0.0 - 0.1				
		FILL / Silty CLAY CH: medium to high plasticity, brown, trace fine gravel, w > PL		D/E	0.2 - 0.3				
	0.5	Silty CLAY CH: medium to high plasticity, brown and red-brown, w < PL, very stiff, residual		D/E	0.5 - 0.6				
56	1.0	Bore discontinued at 1.0m							
55									
54									
53									

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased
TYPE OF BORING: 150mm diameter SFA
WATER OBSERVATIONS: No free ground water 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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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 57.0 mAHD
EASTING: 306399.1
NORTHING: 6268280.3
DIP/AZIMUTH: 90°/--

BORE No: 116
PROJECT No: 94624.00
DATE: 1/8/2020
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
57	0.1	FILL / TOPSOIL: Silty CLAY CH: brown, trace fine gravel and rootlets, w > PL, surficial vegetation		D/E	0.0 0.1				
		FILL / Silty CLAY CH: brown, trace sand and fine to medium sandstone and siltstone gravel, w < PL		D/E	0.2 0.3				
	0.7	Silty CLAY CH: medium to high plasticity, pale brown and red-brown, w < PL, very stiff, residual							
56	1 1.0	Bore discontinued at 1.0m							1
55	2								2
54	3								3
53	4								4

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased
TYPE OF BORING: 150mm diameter SFA
WATER OBSERVATIONS: No free ground water 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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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 56.6 mAHD
EASTING: 306379.3
NORTHING: 6268275.9
DIP/AZIMUTH: 90°/--

BORE No: 117
PROJECT No: 94624.00
DATE: 1/8/2020
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)
56	0.08	FILL / TOPSOIL: Silty CLAY CH: brown, trace fine gravel and rootlets, w > PL, surficial vegetation		D/E	0.0 0.08				
		FILL / Silty CLAY CH: medium to high plasticity, brown, trace gravel, w < PL, appears variably compacted			0.6				
	0.8	Silty CLAY CH: medium to high plasticity, pale brown and red-brown, trace ironstone gravel, w < PL, very stiff, residual, appears generally well compacted		U50	0.9				
55	1.5	Bore discontinued at 1.5m							
54									
53									
52									

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

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased

TYPE OF BORING: 150mm diameter SFA

WATER OBSERVATIONS: No free ground water 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

BOREHOLE LOG

CLIENT: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 56.4 mAHD
EASTING: 306370.4
NORTHING: 6268276.6
DIP/AZIMUTH: 90°/--

BORE No: 118
PROJECT No: 94624.00
DATE: 1/8/2020
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
56	0.05	FILL / TOPSOIL: Silty CLAY CH: brown, trace fine gravel and rootlets, w > PL, surficial vegetation		D/E*	0.05 - 0.1				
		FILL / Silty CLAY CH: medium to high plasticity, grey and brown, trace sand and fine to medium gravel, w < PL		D/E	0.2 - 0.3				
	0.9	Silty CLAY CH: medium to high plasticity, pale brown and red-brown, w < PL, very stiff, residual		D/E	0.9 - 1.0				
55	1.5	Bore discontinued at 1.5m							
54									
53									
52									

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased
TYPE OF BORING: 150mm diameter SFA
WATER OBSERVATIONS: No free ground water observed
REMARKS: *BD2/20200801 sampled at 0.05-0.1m

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)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 56.4 mAHD
EASTING: 306375
NORTHING: 6268242.8
DIP/AZIMUTH: 90°/--

BORE No: 119
PROJECT No: 94624.00
DATE: 2/8/2020
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
56	0.05	FILL / TOPSOIL: Silty CLAY CH: brown, trace fine gravel and rootlets, w > PL, surficial vegetation		D/E	0.0 0.05				
		FILL / Silty CLAY CH: grey-brown, with fine to coarse siltstone gravel, trace sand, w < PL		D/E	0.2 0.3				
	0.6	Silty CLAY CH: medium to high plasticity, pale brown and red-brown, w < PL, stiff, residual		D/E	0.6 0.7				
55	1	1.0m: becoming pale grey mottled orange							1
	1.5	Silty CLAY CH: medium to high plasticity, pale grey and orange-brown, with bands of very low strength siltstone, w <PL, very stiff, residual							
54	2								2
	3								3
	3.1	SILTSTONE: grey, very low to low strength, moderately weathered, Ashfield Shale							
53				D	3.9				
	4 4.0	Bore discontinued at 4.0m			4.0				4
52									

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased
TYPE OF BORING: 150mm diameter SFA
WATER OBSERVATIONS: No free ground water 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: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 54.3 mAHD
EASTING: 306379.1
NORTHING: 6268269.1
DIP/AZIMUTH: 90°/--

BORE No: 120
PROJECT No: 94624.00
DATE: 2/8/2020
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
54	0.0								
	0.1	FILL / TOPSOIL: Silty CLAY CH: brown, trace fine gravel and rootlets, w > PL, surficial vegetation		D/E	0.1				
		FILL / Silty CLAY CH: grey-brown, with fine to coarse siltstone gravel, trace sand, w < PL		D/E	0.2				
	0.3	Bore discontinued at 0.3m			0.3				
53	1								1
52	2								2
51	3								3
50	4								4

RIG: Hand Tools **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased
TYPE OF BORING: 150mm diameter Hand Auger
WATER OBSERVATIONS: No free ground water 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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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 56.9 mAHD
EASTING: 306391
NORTHING: 6268268.2
DIP/AZIMUTH: 90°/--

BORE No: 121
PROJECT No: 94624.00
DATE: 2/8/2020
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
56	0.1	FILL / TOPSOIL: Silty CLAY CH: brown, trace fine gravel and rootlets, w > PL, surficial vegetation							
	0.3	FILL / Silty CLAY CH: grey-brown, with fine to coarse siltstone gravel, trace sand, w < PL							
		Bore discontinued at 0.3m							
	1								1
55	2								2
54	3								3
53	4								4
52									

RIG: Hand Tools **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased
TYPE OF BORING: 150mm diameter Hand Auger
WATER OBSERVATIONS: No free ground water 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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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 58.5 mAHD
EASTING: 306499.8
NORTHING: 6268413.3
DIP/AZIMUTH: 90°/--

BORE No: 122
PROJECT No: 94624.00
DATE: 1/8/2020
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
58	0.1	FILL / TOPSOIL: Sandy CLAY CH: grey-brown, fine to coarse sand, with fine to medium gravel, w > PL, surficial vegetation		D/E	0.0–0.1				
		FILL / Silty CLAY CH: grey-brown, trace fine to medium gravel, w > PL		D/E	0.2–0.3				
	1			S	1.0–1.45		5,7,10 N = 17		1
57	1.5	Silty CLAY CH: medium to high plasticity, grey and orange, trace fine to medium sand, w < PL, stiff to very stiff, residual		D/E	1.5–1.6				
				B					
	2	2.0 Bore discontinued at 2.0m			2.0				2
56									
	3								3
55									
	4								4
54									

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased
TYPE OF BORING: 150mm diameter SFA
WATER OBSERVATIONS: No free ground water 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: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 58.9 mAHD
EASTING: 306510
NORTHING: 6268420.3
DIP/AZIMUTH: 90°/--

BORE No: 123
PROJECT No: 94624.00
DATE: 1/8/2020
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
	0.0			D/E*	0.0				
	0.1	FILL / TOPSOIL: Silty CLAY CH: brown, with fine to medium sand and fine to medium siltstone gravel, trace rootlets, w > PL, surficial vegetation			0.1				
		FILL / Silty CLAY CH: brown, trace sand and gravel, w > PL		D/E	0.2				
	0.5	FILL / Silty CLAY CH: brown, trace sand and fine to coarse siltstone gravel, w < PL			0.3				
58									
	1.0	FILL / Gravelly CLAY CH: grey-brown, gravel is fine to coarse siltstone, trace sand and silt, w < PL		D/E	0.9				
					1.0				
				S			8,7,9 N = 16		
					1.45				
57				D/E	1.9				
	2.0				2.0				
	2.2	Silty CLAY CH: medium plasticity, pale grey and orange, trace fine to medium sand, w < PL, stiff to very stiff, residual		S			6,7,9 N = 16		
					2.45				
56				D	2.9				
	3.0				3.0				
55									
	4.5	Bore discontinued at 4.5m							
54									

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased
TYPE OF BORING: 150mm diameter SFA
WATER OBSERVATIONS: No free ground water observed
REMARKS: *BD1/20200801 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: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 59.2 mAHD
EASTING: 306517.6
NORTHING: 6268412.1
DIP/AZIMUTH: 90°/--

BORE No: 124
PROJECT No: 94624.00
DATE: 1/8/2020
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
59	0.12	FILL / TOPSOIL: Sandy CLAY CL: grey-brown, fine to coarse sand, with fine to medium gravel, w > PL, surficial vegetation		D/E	0.0				
					0.1				
				D/E	0.2				
		FILL / Silty CLAY CH: grey-brown, trace fine to medium gravel, w > PL			0.3				
				B					
58	1.0	FILL / Silty CLAY CH: grey-brown, with fine to coarse siltstone gravel, w < PL, appears generally well compacted			1.0				
				S			7,8,10 N = 18		
					1.45				
				D/E	1.9				
57	2.0	Bore discontinued at 2.0m			2.0				
56									
55									

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** Uncased
TYPE OF BORING: 150mm diameter SFA
WATER OBSERVATIONS: No free ground water 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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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 58.0 mAHD
EASTING: 306446.4
NORTHING: 6268249
DIP/AZIMUTH: 90°/--

BORE No: 101
PROJECT No: 94624.00
DATE: 2/8/2020
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
58	0.04	ASPHALTIC CONCRETE										
		FILL / ROADBASE: Sandy GRAVEL: fine to coarse grained sand and fine to coarse igneous gravel, grey-brown, dry							D/E			
									D/E			
	0.4	Silty CLAY CH: medium to high plasticity, pale brown, with very low strength siltstone bands, w<PL, very stiff, residual										
	0.8								D/E			
57	1	SILTSTONE: grey-brown, very low strength, moderately weathered, with clay seams, Ashfield Shale							S			20/80mm refusal
								Note: Unless stated otherwise all defects are bedding planes dipping 0-10°, pl, ro, fe stn or cly vn				
	1.6	SANDSTONE: fine grained, pale brown then grey, low strength, moderately weathered, fractured, with clay seam (350mm) and a high strength band, Ashfield Shale						1.8m: J, 80°, pl, ro, cly, ct				PL(A) = 0.3
56	2							2.05m: Cs, 350mm				
								2.44m: Cs, 30mm				
	2.8	SILTSTONE: grey-brown, low strength, slightly weathered, fractured, Ashfield Shale						2.82m: J, 75°, pl, ro, fe stn 2.9m: J, 75°, cu, ro, cln 2.97m: J, 80-90°, un, he	C	93	35	PL(A) = 2.3
55	3							3.3m: J, 70-90°, un, ro, he				PL(A) = 0.2
								3.71m: J, 65°, cu, ro, fe stn				
54	4	4.0 SILTSTONE: fine grained, grey-brown, medium strength, slightly weathered, fractured, with 30% sandstone laminations, Ashfield Shale						4.32m: Cs, 10mm	C	100	68	PL(A) = 0.4

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** 0-1.6m

TYPE OF BORING: 150mm diameter SFA to 1.6m then NMLC coring to 5.63m

WATER OBSERVATIONS: No free ground water 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: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 58.0 mAHD
EASTING: 306446.4
NORTHING: 6268249
DIP/AZIMUTH: 90°/--

BORE No: 101
PROJECT No: 94624.00
DATE: 2/8/2020
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
53								4.97m: Ds, 30mm				
	5.13	SILTSTONE: grey, high strength, fresh, slightly fractured, Ashfield Shale							C	100	68	PL(A) = 2.1
	5.63	Bore discontinued at 5.63m										
52	6											
51	7											
50	8											
49	9											

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** 0-1.6m
TYPE OF BORING: 150mm diameter SFA to 1.6m then NMLC coring to 5.63m
WATER OBSERVATIONS: No free ground water 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: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 56.3 mAHD
EASTING: 306367.9
NORTHING: 6268264
DIP/AZIMUTH: 90°/--

BORE No: 102
PROJECT No: 94624.00
DATE: 2/8/2020
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
56	0.1	FILL / TOPSOIL: Silty CLAY: brown, trace fine gravel and rootlets, w > PL, surficial vegetation							D/E			
		FILL / Silty CLAY: grey-brown, with fine to coarse siltstone gravel, trace sand, w < PL							D/E			
									D			
	0.6	Silty CLAY CH: medium to high plasticity, pale brown and red-brown, w < PL, very stiff, residual							D/E			
									D			
55	1								S			7,9,12 N = 21
	1.5	SILTSTONE: grey-brown, very low strength, moderately weathered, Ashfield Shale						Note: Unless stated otherwise all defects are bedding planes dipping 0-10°, pl, ro, fe stn or cly vn	D			
	2 2.0	SANDSTONE: fine grained, pale grey and red-brown, very low strength, highly weathered, sandstone with alternating bands of hard clay, Ashfield Shale						2m: Cs, 180mm	S			20
54								2.26-3.15m: Cs (x9), 10-60mm	C	100	0	
								2.7m: J, 90°, pl, ro, cln				
	3							3.04m: J, 70°, pl, ro, cly ct				PL(A) = 0.05
	3.18	SANDSTONE: fine grained, grey-brown, low strength, moderately weathered, fractured, 30% siltstone laminations, Ashfield Shale						3.34m: J, 45°, pl, ro, cly ct 3.42m: Cs, 20mm				PL(A) = 0.25
53	3.6	SILTSTONE: grey-brown, medium strength, moderately weathered, fractured, 30% sandstone laminations, Ashfield Shale						3.6m: J, 80-90°, cu, ro, cly vn				PL(A) = 0.85
	4							3.84m: Cs, 10mm 3.97m: Cs, 30mm	C	96	58	
								4.18m: Ds, 20mm				
52	4.34	SILTSTONE: grey, high strength, fresh, slightly fractured, Ashfield Shale										PL(A) = 1.07

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** 0-2.0m

TYPE OF BORING: 150mm diameter SFA to 2.0m then NMLC coring to 5.7m

WATER OBSERVATIONS: No free ground water 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: Woolacotts Consulting Engineers Pty Ltd
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 56.3 mAHD
EASTING: 306367.9
NORTHING: 6268264
DIP/AZIMUTH: 90°/--

BORE No: 102
PROJECT No: 94624.00
DATE: 2/8/2020
SHEET 2 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering (EW HW MW SW FS FR)	Graphic Log	Rock Strength (Ex Low / Very Low / Low / Medium / High / Very High / Ex High)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
51		SILTSTONE: grey, high strength, fresh, slightly fractured, Ashfield Shale *(continued)*						5.35m: J, 40°, pl, ro, cln	C	96	58	PL(A) = 1.01
	5.7	Bore discontinued at 5.7m										
50	6											
49	7											
48	8											
47	9											

RIG: Hanjin D&B 8-D **DRILLER:** Rockwell **LOGGED:** JY **CASING:** 0-2.0m
TYPE OF BORING: 150mm diameter SFA to 2.0m then NMLC coring to 5.7m
WATER OBSERVATIONS: No free ground water 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: NSW Department of Education
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 58.5
COORDINATE **E:**306499.1 **N:** 6268371.3
DATUM/GRID: GDA2020 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 203
PROJECT No: 94624.01
DATE: 29/06/21
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
29/06/21, No free groundwater observed	0.0 / 58	TOPSOIL/ (ML) Sandy SILT, trace clay, trace gravel; brown; (Topsoil)		TOP	NA	>PL		A, E		0.0, 0.1		
	0.15	FILL/ (CL) Silty CLAY; grey and brown; low plasticity; trace ripped sandstone gravel 0.2m: concrete fragment (100mm diameter)		FILL	MC	<PL						
	0.5 / 57	(CH) Silty CLAY; red brown; medium to high plasticity		RES	ST	=PL		E		0.5, 0.6		
	1.0 / 56	Borehole discontinued at 1.00m depth Limit of investigation								1		
	2 / 55									2		
	3 / 54									3		
	4									4		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 3.5 Tonne Mini Excavator
METHOD: 150mm diameter SFA to 1.0m
REMARKS:

OPERATOR: A&A Hire
CASING:

LOGGED: JY

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BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 58.2
COORDINATE **E:**306492 **N:** 6268426.9
DATUM/GRID: GDA2020 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 204
PROJECT No: 94624.01
DATE: 29/06/21
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	58 / 0.0	TOPSOIL/ (CL) Silty CLAY, trace gravel; brown; low plasticity; with vegetation throughout (Topsoil)		TOP	NA	<PL		A, E		0.0, 0.1		
	0.1	FILL/ (CL) Silty CLAY, trace gravel; grey brown; low plasticity		FILL	ND	<PL		A, E		0.4, 0.5		
	57 / 1							A, E		0.9, 1.0		
	1.3	(CI) Silty CLAY; pale brown and yellow; medium plasticity		RES	VST	<PL		A, E		1.3, 1.4		
	1.6	Borehole discontinued at 1.60m depth Limit of investigation										
	56 / 2									2		
	55 / 3									3		
	54 / 4									4		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hanjin 8D
METHOD: 150mm diameter SFA to 1.6m
REMARKS:

OPERATOR: Rockwell
CASING:

LOGGED: KA

EXPORTED 21/07/21 16:05. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 58.9
COORDINATE **E:**306511.3 **N:** 6268408.1
DATUM/GRID: GDA2020 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 205
PROJECT No: 94624.01
DATE: 29/06/21
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
29/06/21, No free groundwater observed	58 / 0.0	TOPSOIL/ (CL) Silty CLAY, with gravel; brown black; low plasticity; with vegetation throughout		TOP	NA	<PL		A E		0.1		
	0.2	(Topsoil)										
		(Cl) Silty CLAY, with gravel; brown; low to medium plasticity		RES	ST	<PL		A E		0.5		
	0.6	(Cl) Silty CLAY, with gravel; brown orange; low to medium plasticity		RES	ST	<PL						
	1 / 1.1	(Cl) Silty CLAY; grey brown; medium plasticity		RES	ST	<PL		A E		1.0		
	1.5	Borehole discontinued at 1.50m depth Limit of investigation						A E		1.5		
	57 / 2									2		
	56 / 3									3		
	55 / 4									4		
	54											

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hanjin 8D
METHOD: 150mm diameter SFA to 1.50m
REMARKS:

OPERATOR: Rockwell
CASING:

LOGGED: KA

EXPORTED 21/07/21 16:05. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 59.2
COORDINATE **E:**306522.7 **N:** 6268396
DATUM/GRID: GDA2020 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 206
PROJECT No: 94624.01
DATE: 29/06/21
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
29/06/21, No free groundwater observed	59 / 0.0	(ML) Clayey SILT; pale brown		RES	NA	<PL		A E		0.0 – 0.1		
	0.5	(CI) Silty CLAY; pale brown; medium plasticity		RES	ST	<PL		A E E		0.4 – 0.5 – 0.6		
	58 / 1.0	Borehole discontinued at 1.00m depth Limit of investigation								1		
	57 / 2									2		
	56 / 3									3		
	55 / 4									4		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 3.5 Tonne Mini Excavator
METHOD: 150mm diameter SFA to 1.0m
REMARKS: Bore in garden bed. BD2/20210629 sampled at 0-0.1m

OPERATOR: A&A Hire
CASING:

LOGGED: JY

EXPORTED 10/08/21 13:03. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 59.4
COORDINATE **E:**306519.6 **N:** 6268378.2
DATUM/GRID: GDA2020 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 207
PROJECT No: 94624.01
DATE: 29/06/21
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
29/06/21, No free groundwater observed	59 / 0.0–0.1	TOPSOIL/ (ML) Sandy SILT, trace clay, trace gravel; orange; with vegetation throughout (Topsoil)		TOP	NA	<PL		A, E	0.0–0.1	0.0–0.1		
		FILL/ (CL) Silty CLAY, trace clay, trace gravel; brown; low plasticity		FILL	WC	<PL		A, E	0.4–0.5	0.4–0.5		
	58 / 0.8–1	(Cl) Silty CLAY, trace sand, trace gravel; brown; medium plasticity		RES	ST TO VST	<PL		A, E	0.9–1.0	0.9–1.0		
								A, E	1.4–1.5	1.4–1.5		
	57 / 2.0	(Cl) Silty CLAY; red brown; medium plasticity		RES	VST	<PL		A, E, E	1.9–2.1	1.9–2.1		
	2.3	(Cl) Silty CLAY; pale grey mottled orange; medium plasticity		RES	VST	<PL						
	2.7	SILTSTONE; grey; very low strength, (Ashfield Shale)		NA	NA	NA						
	2.9 / 3 / 56	Borehole discontinued at 2.90m depth Limit of investigation								3		
	4 / 55									4		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 3.5 Tonne Mini Excavator
METHOD: 150mm diameter SFA to 2.90m
REMARKS: BD1/20210629 sampled at 0-0.1m

OPERATOR: A&A Hire
CASING:

LOGGED: JY

EXPORTED 21/07/21 16:05. TEMPLATE ID: DP_101.02.00_SOILLOG

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 59.2
COORDINATE **E:**306513.9 **N:** 6268391.1
DATUM/GRID: GDA2020 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 208
PROJECT No: 94624.01
DATE: 29/06/21
SHEET: 1 of 1

CONDITIONS ENCOUNTERED								SAMPLE				TESTING AND REMARKS	
GROUNDWATER	RL (m) / DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
29/06/21, No free groundwater observed	59 / 0.0	TOPSOIL/ (CL) Silty CLAY; brown; low plasticity; (Topsoil)		TOP	NA	<PL						
	0.08	FILL/ (CL) Silty CLAY; brown; low plasticity		FILL	NA	<PL		A E	0.4 0.5	0.4 0.5		
	58 / 0.7	(CI) Silty CLAY; grey mottled orange; medium plasticity		RES	ST	<PL		A E	0.7 0.8	0.7 0.8		
	1									1		
	1.2	(CI) Silty CLAY; brown; medium plasticity; with ironstone gravel		RES	ST	<PL						
	1.5	Borehole discontinued at 1.50m depth Limit of investigation										
	2									2		
	57											
	3									3		
	56											
	4									4		
	55											

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: 3.5 Tonne Mini Excavator
METHOD: 150mm diameter SFA to 1.50m
REMARKS: Bore located at 0.5m from driveway kerb

OPERATOR: A&A Hire
CASING:

LOGGED: JY

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 58.1
COORDINATE E:306488.2 **N:** 6268414
DATUM/GRID: GDA2020 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 201
PROJECT No: 94624.01
DATE: 29/06/21
SHEET: 1 of 2

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
29/06/21, No free groundwater observed	58	0.0	FILL/ Silty CLAY, with gravel; brown; with vegetation throughout (Topsoil)		FILL	NA	<PL													
		0.2	(Cl) Silty CLAY, trace gravel; pale brown grey; medium plasticity; trace vegetation; stiff		RES	ST	<PL									A E		0.2 0.3		
																A E U50		0.5 0.6 0.75		
	57	1														A E SPT		1.0 1.1 1.45	SPT	4,5,8 N=13
		1.5	(Cl) Silty CLAY; pale brown; medium plasticity; stiff to very stiff		RES	ST TO VST	<PL									A E		1.5 1.6		
	56	2.0	(Cl-CH) Silty CLAY; grey mottled orange and yellow; medium to high plasticity; hard		RES	H	<PL									SPT		2 2.5 2.95	SPT	8,18,18 N=36
	55	3.0	(CH) Silty CLAY, with gravel; grey; high plasticity; (extremely weathered siltstone)		RES	H	<PL											3		
	54	4												Unless otherwise noted all defects are bedding planes dipping at 0- 10 degrees		SPT		4.0 4.15	SPT	25,2/0 refusal
		4.2	SILTSTONE; brown grey; fine; low to medium strength, (Ashfield Shale)					MW	4.2	L-M	100	82		4.2-4.34m: J 50°-60° PL, SM, FE STN 4.46-4.5m: CS 40mm				4.2	PLT	PL(A)=0.13

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

EXPORTED 14/07/21 15:20. TEMPLATE ID: DP_103.02.00_COMBINED

PLANT: Hanjin 8D
OPERATOR: Rockwell
LOGGED: KA

METHOD: 110mm SFA to 4.0m, NMLC to 9.62m
CASING: HQ to 4.0m

REMARKS:

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 58.1
COORDINATE E:306488.2 **N:** 6268414
DATUM/GRID: GDA2020 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 201
PROJECT No: 94624.01
DATE: 29/06/21
SHEET: 2 of 2

CONDITIONS ENCOUNTERED																	SAMPLE				TESTING	
				SOIL				ROCK														
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH VL L M H VH EH	RECOVERY (%)	RQD	FRACTURE SPACING (m) 0.01 0.05 0.10 0.50 1.00 5.00	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	53		SILTSTONE; brown grey; fine; low to medium strength, (Ashfield Shale) *(continued)*					MW		L-M										
		5.52	SILTSTONE; pale grey; fine; high strength, (Ashfield Shale)						5.52		100	82				C			PLT	PL(A)=0.72
	52	6						SW-FR		H								6	PLT	PL(A)=1.5
		6.77	SILTSTONE; grey; fine; high strength, (Ashfield shale)						6.77									6.62		
		7												4.2-9.62m: B x40 0°-5° PL, SM, CLY/CLN STN				7	PLT	PL(A)=1.7
	51																			
		8						FR		H	100	98				C		8	PLT	PL(A)=1.5
	50													8.58-8.69m: J 85°-90° PL, SM, CLN						
		9																9	PLT	PL(A)=1.6
	49													9.21-9.26m: J x3 85°-90° PL, SM, CLN						
		9.62	Borehole discontinued at 9.62m depth Limit of investigation						9.62									9.62		

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

EXPORTED 14/07/21 15:20. TEMPLATE ID: DP_103.02.00_COMBINED

PLANT: Hanjin 8D
METHOD: 110mm SFA to 4.0m, NMLC to 9.62m
REMARKS:

OPERATOR: Rockwell
CASING: HQ to 4.0m

LOGGED: KA

Refer to explanatory notes for symbol and abbreviation definitions

Douglas Partners
Geotechnics | Environment | Groundwater

BORE: BH201 PROJECT: 94624.01 July 2021

4.2m – 9.0m

BORE: BH201 PROJECT: 94624.01 July 2021

9.0m – 9.62m

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 59.4
COORDINATE **E:**306526.6 **N:** 6268415.3
DATUM/GRID: GDA2020 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 202
PROJECT No: 94624.01
DATE: 29/06/21
SHEET: 1 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL ORIGIN(#)	SOIL CONSIS.(*) DENSITY.(*)	SOIL MOISTURE	ROCK WEATH.	ROCK DEPTH (m)	ROCK STRENGTH	ROCK RECOVERY (%)	ROCK RQD	ROCK FRACTURE SPACING (m)	ROCK DEFECTS & REMARKS	SAMPLE REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
29/06/21, No free groundwater observed	59	0.0	FILL/ (CL) Silty CLAY, with gravel; brown; low plasticity; with vegetation throughout (Topsoil)		FILL	NA	<PL											0.2		
		0.2	FILL/ (CL) Silty CLAY, with gravel; brown; low plasticity; trace vegetation		FILL	ND	<PL									A E		0.25 0.5		
		0.7	(CI) Silty CLAY; grey mottled yellow; medium plasticity; very stiff		RES	VST	<PL									A E		0.55 1.0		
	58	1														A E SPT		1.05 1.45	SPT	6,13,12 N=25
		1.8	(CI-CH) Silty CLAY; pale yellow mottled orange and brown; medium to high plasticity; very stiff		RES	VST	<PL									A E		1.5 1.55		
	57	2																2		
		3.0	(CI-CH) Silty CLAY; grey mottled yellow and orange; medium to high plasticity; hard, (possibly extremely weathered siltstone)		RES	H	<PL									SPT		2.5 2.95	SPT	8,10,12 N=22
	56	3																3		
	55	4			RES	H	<PL									SPT		4.0 4.45	SPT	10,21,29 N=50

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Hanjin 8D
METHOD: 110mm diameter SFA to 5.5m, NMLC coring to 11.56m
REMARKS:

OPERATOR: Rockwell
CASING: HQ to 5.5m

LOGGED: KA

EXPORTED 21/07/21 16:14, TEMPLATE ID: DP_103.02.00_COMBINED

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 59.4
COORDINATE **E:**306526.6 **N:** 6268415.3
DATUM/GRID: GDA2020 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 202
PROJECT No: 94624.01
DATE: 29/06/21
SHEET: 2 of 3

CONDITIONS ENCOUNTERED																				SAMPLE				TESTING	
				SOIL				ROCK																	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH VL L M H VH EH	RECOVERY (%)	RQD	FRACTURE SPACING (m) 0.01 0.05 0.10 0.50 1.00 5.00	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	54	5.6	(CI-CH) Silty CLAY; grey mottled yellow and orange; medium to high plasticity; hard, (possibly extremely weathered siltstone) *(continued)*		RES	H	<PL													
			SILTSTONE; grey mottled orange brown; fine; low strength (Ashfield Shale)					SW	5.6	L				Unless otherwise noted all defects are bedding planes dipping at 0-10 degreees				5.6	PLT	0.12
	53	6.2	SILTSTONE; grey; fine; high strength (Ashfield Shale)						6.2											
	52	7									100	86		7.15-7.17m: CS 20mm		C		7	PLT	1.7
	51	8						FR		H								8	PLT	1.4
	50	9									100	77					8.45	9	PLT	1.5
																			PLT	1.7

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

EXPORTED 21/07/21 16:14, TEMPLATE ID: DP_103.02.00_COMBINED

PLANT: Hanjin 8D
OPERATOR: Rockwell
LOGGED: KA

METHOD: 110mm diameter SFA to 5.5m, NMLC coring to 11.56m
CASING: HQ to 5.5m

REMARKS:

BOREHOLE LOG

CLIENT: NSW Department of Education
PROJECT: John Palmer Public School Upgrade
LOCATION: 85 The Ponds Boulevard, The Ponds

SURFACE LEVEL: 59.4
COORDINATE **E:**306526.6 **N:** 6268415.3
DATUM/GRID: GDA2020 Zone 56
DIP/AZIMUTH: 90°/---

LOCATION ID: 202
PROJECT No: 94624.01
DATE: 29/06/21
SHEET: 3 of 3

CONDITIONS ENCOUNTERED																		SAMPLE				TESTING	
				SOIL			ROCK																
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH VL L M H VH EH	RECOVERY (%)	RQD	FRACTURE SPACING (m) 0.01 0.05 0.10 0.50 1.00 5.00	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	49		SILTSTONE; grey; fine; high strength (Ashfield Shale) *(continued)*					FR		H	100	77				C			PLT	2.3
		11.0							11.0									11		
	48		SILTSTONE; grey; fine; very high strength (Ashfield Shale)							VH									PLT	3.8
		11.56							11.56									11.56		
			Borehole discontinued at 11.56m depth Limit of investigation																	
	12																	12		
	47																			
	13																	13		
	46																			
	14																	14		
	45																			

NOTES: (#)Soil origin is "probable" unless otherwise stated. (*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

EXPORTED 21/07/21 16:14, TEMPLATE ID: DP_103.02.00_COMBINED

PLANT: Hanjin 8D
OPERATOR: Rockwell
LOGGED: KA

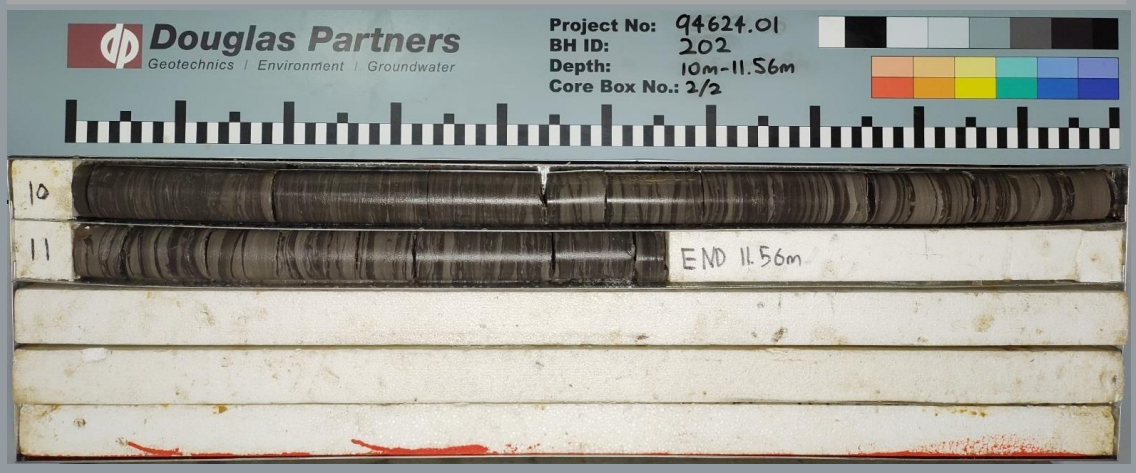
METHOD: 110mm diameter SFA to 5.5m, NMLC coring to 11.56m
CASING: HQ to 5.5m

REMARKS:

BORE: BH202 PROJECT: 94624.01 July 2021

5.6m – 10.0m

BORE: BH202 PROJECT: 94624.01 July 2021



10.0m – 11.56m

Appendix I

Laboratory Certificates of Analysis,
Chain of Custody Documentation and Sample Receipt Advice

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 273223

Client Details

Client	Douglas Partners Pty Ltd (Riverstone)
Attention	Gavin Boyd
Address	43 Hobart St, Riverstone, NSW, 2765

Sample Details

Your Reference	**94624.01, The Ponds**
Number of Samples	25 Soil
Date samples received	02/07/2021
Date completed instructions received	02/07/2021

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	09/07/2021
Date of Issue	09/07/2021

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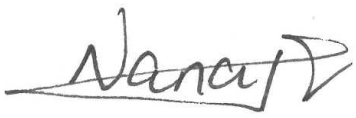
Asbestos Approved By
Analysed by Asbestos Approved Identifier: Panika Wongchanda
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Diego Bigolin, Team Leader, Inorganics
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Hannah Nguyen, Senior Chemist
Lucy Zhu, Asbestos Supervisor
Priya Samarawickrama, Senior Chemist
Steven Luong, Organics Supervisor
Thomas Beenie, Lab Technician

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		273223-1	273223-2	273223-3	273223-4	273223-5
Your Reference	UNITS	BH201	BH202	BH203	BH204	BH205
Depth		0.2m	0.2m	0-0.1m	0.4-0.5m	0.1m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
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	%	92	93	93	89	91

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		273223-6	273223-7	273223-8	273223-9	273223-10
Your Reference	UNITS	BH206	BH206	BH207	BH207	BH208
Depth		0-0.1m	0.4-0.5m	0-0.1m	0.4-0.5m	0.4-0.5m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
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	%	103	87	86	72	92

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		273223-11	273223-12	273223-13	273223-14	273223-15
Your Reference	UNITS	BH201	BH203	BH206	BD1/20210629	BD2/20210629
Depth		0.5m	0.5-0.6m	0.5-0.6m	-	-
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
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	%	115	86	81	86	97

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		273223-16	273223-17
Your Reference	UNITS	Trip Spike	Trip Blank
Depth		-	-
Date Sampled		28/06/2021	28/06/2021
Type of sample		Soil	Soil
Date extracted	-	05/07/2021	05/07/2021
Date analysed	-	06/07/2021	06/07/2021
TRH C_6 - C_9	mg/kg	[NA]	<25
TRH C_6 - C_{10}	mg/kg	[NA]	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	[NA]	<25
Benzene	mg/kg	81%	<0.2
Toluene	mg/kg	89%	<0.5
Ethylbenzene	mg/kg	86%	<1
m+p-xylene	mg/kg	86%	<2
o-Xylene	mg/kg	89%	<1
naphthalene	mg/kg	[NA]	<1
Total +ve Xylenes	mg/kg	[NA]	<3
Surrogate aaa-Trifluorotoluene	%	85	97

svTRH (C10-C40) in Soil						
Our Reference		273223-1	273223-2	273223-3	273223-4	273223-5
Your Reference	UNITS	BH201	BH202	BH203	BH204	BH205
Depth		0.2m	0.2m	0-0.1m	0.4-0.5m	0.1m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
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	%	74	75	81	82	77

svTRH (C10-C40) in Soil						
Our Reference		273223-6	273223-7	273223-8	273223-9	273223-10
Your Reference	UNITS	BH206	BH206	BH207	BH207	BH208
Depth		0-0.1m	0.4-0.5m	0-0.1m	0.4-0.5m	0.4-0.5m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
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	%	83	85	85	80	80

svTRH (C10-C40) in Soil						
Our Reference		273223-11	273223-12	273223-13	273223-14	273223-15
Your Reference	UNITS	BH201	BH203	BH206	BD1/20210629	BD2/20210629
Depth		0.5m	0.5-0.6m	0.5-0.6m	-	-
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
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	%	81	80	81	82	80

PAHs in Soil						
Our Reference		273223-1	273223-2	273223-3	273223-4	273223-5
Your Reference	UNITS	BH201	BH202	BH203	BH204	BH205
Depth		0.2m	0.2m	0-0.1m	0.4-0.5m	0.1m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
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	1.5
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.5
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	3.5
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	3.6
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	1.9
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	1.7
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	3.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	2.2
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	1.4
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	1.9
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	22
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	3.1
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	3.1
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	3.1
Surrogate p-Terphenyl-d14	%	115	110	109	109	108

PAHs in Soil						
Our Reference		273223-6	273223-7	273223-8	273223-9	273223-10
Your Reference	UNITS	BH206	BH206	BH207	BH207	BH208
Depth		0-0.1m	0.4-0.5m	0-0.1m	0.4-0.5m	0.4-0.5m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
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	%	115	105	104	103	115

PAHs in Soil						
Our Reference		273223-11	273223-12	273223-13	273223-14	273223-15
Your Reference	UNITS	BH201	BH203	BH206	BD1/20210629	BD2/20210629
Depth		0.5m	0.5-0.6m	0.5-0.6m	-	-
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
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	%	127	120	140	123	101

Organochlorine Pesticides in soil						
Our Reference		273223-1	273223-2	273223-3	273223-4	273223-5
Your Reference	UNITS	BH201	BH202	BH203	BH204	BH205
Depth		0.2m	0.2m	0-0.1m	0.4-0.5m	0.1m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	06/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	07/07/2021
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	%	87	89	82	86	93

Organochlorine Pesticides in soil						
Our Reference		273223-6	273223-7	273223-8	273223-9	273223-10
Your Reference	UNITS	BH206	BH206	BH207	BH207	BH208
Depth		0-0.1m	0.4-0.5m	0-0.1m	0.4-0.5m	0.4-0.5m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
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	%	87	94	94	94	91

Organophosphorus Pesticides in Soil						
Our Reference		273223-1	273223-2	273223-3	273223-4	273223-5
Your Reference	UNITS	BH201	BH202	BH203	BH204	BH205
Depth		0.2m	0.2m	0-0.1m	0.4-0.5m	0.1m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	06/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	07/07/2021
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	%	87	89	82	86	93

Organophosphorus Pesticides in Soil						
Our Reference		273223-6	273223-7	273223-8	273223-9	273223-10
Your Reference	UNITS	BH206	BH206	BH207	BH207	BH208
Depth		0-0.1m	0.4-0.5m	0-0.1m	0.4-0.5m	0.4-0.5m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
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	%	87	94	94	94	91

PCBs in Soil						
Our Reference		273223-1	273223-2	273223-3	273223-4	273223-5
Your Reference	UNITS	BH201	BH202	BH203	BH204	BH205
Depth		0.2m	0.2m	0-0.1m	0.4-0.5m	0.1m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	06/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	07/07/2021
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	%	87	89	82	86	93

PCBs in Soil						
Our Reference		273223-6	273223-7	273223-8	273223-9	273223-10
Your Reference	UNITS	BH206	BH206	BH207	BH207	BH208
Depth		0-0.1m	0.4-0.5m	0-0.1m	0.4-0.5m	0.4-0.5m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
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	%	87	94	94	94	91

Acid Extractable metals in soil						
Our Reference		273223-1	273223-2	273223-3	273223-4	273223-5
Your Reference	UNITS	BH201	BH202	BH203	BH204	BH205
Depth		0.2m	0.2m	0-0.1m	0.4-0.5m	0.1m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Date analysed	-	07/07/2021	07/07/2021	07/07/2021	07/07/2021	07/07/2021
Arsenic	mg/kg	9	7	6	7	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	13	11	10	10
Copper	mg/kg	14	12	6	18	41
Lead	mg/kg	15	12	11	14	8
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	7	5	4	6	7
Zinc	mg/kg	26	25	20	34	21

Acid Extractable metals in soil						
Our Reference		273223-6	273223-7	273223-8	273223-9	273223-10
Your Reference	UNITS	BH206	BH206	BH207	BH207	BH208
Depth		0-0.1m	0.4-0.5m	0-0.1m	0.4-0.5m	0.4-0.5m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Date analysed	-	07/07/2021	07/07/2021	07/07/2021	07/07/2021	07/07/2021
Arsenic	mg/kg	7	4	5	5	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	12	6	9	8	15
Copper	mg/kg	12	10	5	16	18
Lead	mg/kg	15	8	10	9	13
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	6	4	13	17
Zinc	mg/kg	27	31	15	40	54

Acid Extractable metals in soil						
Our Reference		273223-11	273223-12	273223-13	273223-14	273223-15
Your Reference	UNITS	BH201	BH203	BH206	BD1/20210629	BD2/20210629
Depth		0.5m	0.5-0.6m	0.5-0.6m	-	-
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Date analysed	-	07/07/2021	07/07/2021	07/07/2021	07/07/2021	07/07/2021
Arsenic	mg/kg	6	6	5	8	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	7	11	7	12	10
Copper	mg/kg	22	11	20	9	9
Lead	mg/kg	12	11	13	10	12
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	13	4	23	3	4
Zinc	mg/kg	50	19	67	19	21

Acid Extractable metals in soil		
Our Reference		273223-26
Your Reference	UNITS	BH208 - [TRIPLICATE]
Depth		0.4-0.5m
Date Sampled		29/06/2021
Type of sample		Soil
Date prepared	-	06/07/2021
Date analysed	-	07/07/2021
Arsenic	mg/kg	6
Cadmium	mg/kg	<0.4
Chromium	mg/kg	10
Copper	mg/kg	17
Lead	mg/kg	12
Mercury	mg/kg	<0.1
Nickel	mg/kg	8
Zinc	mg/kg	25

Misc Soil - Inorg						
Our Reference		273223-1	273223-2	273223-3	273223-4	273223-5
Your Reference	UNITS	BH201	BH202	BH203	BH204	BH205
Depth		0.2m	0.2m	0-0.1m	0.4-0.5m	0.1m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Date analysed	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference		273223-6	273223-7	273223-8	273223-9	273223-10
Your Reference	UNITS	BH206	BH206	BH207	BH207	BH208
Depth		0-0.1m	0.4-0.5m	0-0.1m	0.4-0.5m	0.4-0.5m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Date analysed	-	05/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Moisture						
Our Reference		273223-1	273223-2	273223-3	273223-4	273223-5
Your Reference	UNITS	BH201	BH202	BH203	BH204	BH205
Depth		0.2m	0.2m	0-0.1m	0.4-0.5m	0.1m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Moisture	%	15	11	13	12	11

Moisture						
Our Reference		273223-6	273223-7	273223-8	273223-9	273223-10
Your Reference	UNITS	BH206	BH206	BH207	BH207	BH208
Depth		0-0.1m	0.4-0.5m	0-0.1m	0.4-0.5m	0.4-0.5m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Moisture	%	16	9.4	7.6	5.7	9.8

Moisture						
Our Reference		273223-11	273223-12	273223-13	273223-14	273223-15
Your Reference	UNITS	BH201	BH203	BH206	BD1/20210629	BD2/20210629
Depth		0.5m	0.5-0.6m	0.5-0.6m	-	-
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/07/2021	05/07/2021	05/07/2021	05/07/2021	05/07/2021
Date analysed	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Moisture	%	7.2	13	8.6	3.2	2.2

Asbestos ID - soils						
Our Reference		273223-1	273223-2	273223-3	273223-4	273223-5
Your Reference	UNITS	BH201	BH202	BH203	BH204	BH205
Depth		0.2m	0.2m	0-0.1m	0.4-0.5m	0.1m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	09/07/2021	09/07/2021	09/07/2021	09/07/2021	09/07/2021
Sample mass tested	g	Approx. 40g	Approx. 40g	Approx. 40g	Approx. 55g	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		273223-6	273223-7	273223-8	273223-9	273223-10
Your Reference	UNITS	BH206	BH206	BH207	BH207	BH208
Depth		0-0.1m	0.4-0.5m	0-0.1m	0.4-0.5m	0.4-0.5m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	09/07/2021	09/07/2021	09/07/2021	09/07/2021	09/07/2021
Sample mass tested	g	Approx. 75g	Approx. 55g	Approx. 45g	Approx. 65g	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		273223-11	273223-12	273223-13
Your Reference	UNITS	BH201	BH203	BH206
Depth		0.5m	0.5-0.6m	0.5-0.6m
Date Sampled		29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil
Date analysed	-	09/07/2021	09/07/2021	09/07/2021
Sample mass tested	g	Approx. 30g	Approx. 25g	Approx. 30g
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		273223-6	273223-7	273223-8	273223-9	273223-18
Your Reference	UNITS	BH206	BH206	BH207	BH207	BH208
Depth		0-0.1m	0.4-0.5m	0-0.1m	0.4-0.5m	0.7-0.8m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Date analysed	-	07/07/2021	07/07/2021	07/07/2021	07/07/2021	07/07/2021
pH 1:5 soil:water	pH Units	7.1	8.2	7.2	8.9	5.6
Chloride, Cl 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	[NA]	160
Sulphate, SO4 1:5 soil:water	mg/kg	[NA]	[NA]	[NA]	[NA]	200

Misc Inorg - Soil						
Our Reference		273223-19	273223-20	273223-21	273223-22	273223-23
Your Reference	UNITS	BH205	BH207	BH207	BH204	BH204
Depth		1m	0.9-1m	1.4-1.5m	0-0.1m	0.9-1m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/07/2021	06/07/2021	06/07/2021	06/07/2021	06/07/2021
Date analysed	-	07/07/2021	07/07/2021	07/07/2021	07/07/2021	07/07/2021
pH 1:5 soil:water	pH Units	8.6	8.4	6.8	8.2	6.7
Chloride, Cl 1:5 soil:water	mg/kg	400	[NA]	[NA]	[NA]	[NA]
Sulphate, SO4 1:5 soil:water	mg/kg	310	[NA]	[NA]	[NA]	[NA]

Misc Inorg - Soil			
Our Reference		273223-24	273223-25
Your Reference	UNITS	BH204	BH205
Depth		1.3-1.4m	0.5m
Date Sampled		29/06/2021	29/06/2021
Type of sample		Soil	Soil
Date prepared	-	06/07/2021	06/07/2021
Date analysed	-	07/07/2021	07/07/2021
pH 1:5 soil:water	pH Units	7.9	8.5

ESP/CEC				
Our Reference		273223-18	273223-19	273223-22
Your Reference	UNITS	BH208	BH205	BH204
Depth		0.7-0.8m	1m	0-0.1m
Date Sampled		29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil
Date prepared	-	08/07/2021	08/07/2021	08/07/2021
Date analysed	-	08/07/2021	08/07/2021	08/07/2021
Exchangeable Ca	meq/100g	1.4	15	24
Exchangeable K	meq/100g	0.2	0.2	0.5
Exchangeable Mg	meq/100g	3.6	8.7	2.3
Exchangeable Na	meq/100g	0.98	1.2	0.13
Cation Exchange Capacity	meq/100g	6.2	25	27
ESP	%	16	5	<1

Texture and Salinity*						
Our Reference		273223-6	273223-7	273223-8	273223-9	273223-18
Your Reference	UNITS	BH206	BH206	BH207	BH207	BH208
Depth		0-0.1m	0.4-0.5m	0-0.1m	0.4-0.5m	0.7-0.8m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/07/2021	07/07/2021	07/07/2021	07/07/2021	07/07/2021
Date analysed	-	07/07/2021	07/07/2021	07/07/2021	07/07/2021	07/07/2021
Electrical Conductivity 1:5 soil:water	µS/cm	120	220	97	450	250
Texture Value	-	9.0	9.0	9.0	9.0	7.0
Texture	-	CLAY LOAM	CLAY LOAM	CLAY LOAM	CLAY LOAM	MEDIUM CLAY
ECe	dS/m	<2	<2	<2	4.1	<2
Class	-	NON SALINE	NON SALINE	NON SALINE	MODERATELY SALINE	NON SALINE

Texture and Salinity*						
Our Reference		273223-19	273223-20	273223-21	273223-22	273223-23
Your Reference	UNITS	BH205	BH207	BH207	BH204	BH204
Depth		1m	0.9-1m	1.4-1.5m	0-0.1m	0.9-1m
Date Sampled		29/06/2021	29/06/2021	29/06/2021	29/06/2021	29/06/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	07/07/2021	07/07/2021	07/07/2021	07/07/2021	07/07/2021
Date analysed	-	07/07/2021	07/07/2021	07/07/2021	07/07/2021	07/07/2021
Electrical Conductivity 1:5 soil:water	µS/cm	570	630	340	180	450
Texture Value	-	7.0	9.0	9.0	9.0	7.0
Texture	-	MEDIUM CLAY	CLAY LOAM	CLAY LOAM	CLAY LOAM	MEDIUM CLAY
ECe	dS/m	4.0	5.7	3.0	<2	3.2
Class	-	SLIGHTLY SALINE	MODERATELY SALINE	SLIGHTLY SALINE	NON SALINE	SLIGHTLY SALINE

Texture and Salinity*			
Our Reference		273223-24	273223-25
Your Reference	UNITS	BH204	BH205
Depth		1.3-1.4m	0.5m
Date Sampled		29/06/2021	29/06/2021
Type of sample		Soil	Soil
Date prepared	-	07/07/2021	07/07/2021
Date analysed	-	07/07/2021	07/07/2021
Electrical Conductivity 1:5 soil:water	µS/cm	280	370
Texture Value	-	7.0	9.0
Texture	-	MEDIUM CLAY	CLAY LOAM
ECe	dS/m	<2	3.3
Class	-	NON SALINE	SLIGHTLY 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-14	273223-2
Date extracted	-			05/07/2021	1	05/07/2021	05/07/2021		05/07/2021	05/07/2021
Date analysed	-			06/07/2021	1	06/07/2021	06/07/2021		06/07/2021	06/07/2021
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	103	111
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	103	111
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	91	98
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	99	106
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	107	114
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	109	118
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	106	115
naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	102	1	92	107	15	97	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]	10	05/07/2021	05/07/2021		[NT]	[NT]
Date analysed	-			[NT]	10	06/07/2021	06/07/2021		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	10	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	10	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	10	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	10	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	10	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	10	92	78	16	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	273223-2
Date extracted	-			05/07/2021	1	05/07/2021	05/07/2021		05/07/2021	05/07/2021
Date analysed	-			06/07/2021	1	06/07/2021	06/07/2021		06/07/2021	06/07/2021
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	87	77
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	100	88
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	80	71
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	87	77
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	100	88
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	80	71
Surrogate o-Terphenyl	%		Org-020	78	1	74	73	1	102	75

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	05/07/2021	05/07/2021		[NT]	[NT]
Date analysed	-			[NT]	10	06/07/2021	06/07/2021		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	10	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	10	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	10	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	10	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	10	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	10	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	10	80	82	2	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	273223-2
Date extracted	-			05/07/2021	1	05/07/2021	05/07/2021		05/07/2021	05/07/2021
Date analysed	-			06/07/2021	1	06/07/2021	06/07/2021		06/07/2021	06/07/2021
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	92
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	84	69
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	93	89
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	91	97
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	88	78
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	76
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	67	66
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	86	79
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	109	1	115	113	2	115	106

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	5	05/07/2021	05/07/2021		[NT]	[NT]
Date analysed	-			[NT]	5	06/07/2021	06/07/2021		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	5	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	5	0.2	0.2	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	5	<0.1	0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	5	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	5	1.5	1.7	12	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	5	0.5	0.5	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	5	3.5	4.3	21	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	5	3.6	4.3	18	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	5	1.9	2.2	15	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	5	1.7	1.9	11	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	5	3.2	4.4	32	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	5	2.2	3.5	46	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	5	1.4	1.9	30	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	5	0.2	0.4	67	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	5	1.9	2.4	23	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	5	108	110	2	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	05/07/2021	05/07/2021		[NT]	[NT]
Date analysed	-			[NT]	10	06/07/2021	06/07/2021		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	10	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	10	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	10	115	117	2	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	273223-2
Date extracted	-			05/07/2021	1	05/07/2021	05/07/2021		05/07/2021	05/07/2021
Date analysed	-			06/07/2021	1	06/07/2021	06/07/2021		06/07/2021	06/07/2021
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	77
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	92	74
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	89	89
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	92	85
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	90
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	99	96
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	93
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	96
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	95	94
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	88	84
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	100	1	87	90	3	99	86

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	05/07/2021	05/07/2021		[NT]	[NT]
Date analysed	-			[NT]	10	06/07/2021	06/07/2021		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	10	91	94	3	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	273223-2
Date extracted	-			05/07/2021	1	05/07/2021	05/07/2021		05/07/2021	05/07/2021
Date analysed	-			06/07/2021	1	06/07/2021	06/07/2021		06/07/2021	06/07/2021
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	89
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	89	82
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	91	85
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	116	104
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	101	95
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	84
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	99	101
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	100	1	87	90	3	99	86

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	05/07/2021	05/07/2021		[NT]	[NT]
Date analysed	-			[NT]	10	06/07/2021	06/07/2021		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	10	91	94	3	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	273223-2
Date extracted	-			05/07/2021	1	05/07/2021	05/07/2021		05/07/2021	05/07/2021
Date analysed	-			06/07/2021	1	06/07/2021	06/07/2021		06/07/2021	06/07/2021
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	100	100
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	100	1	87	90	3	99	86

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	10	05/07/2021	05/07/2021		[NT]	[NT]
Date analysed	-			[NT]	10	06/07/2021	06/07/2021		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	10	91	94	3	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-14	273223-2
Date prepared	-			06/07/2021	1	06/07/2021	06/07/2021		06/07/2021	06/07/2021
Date analysed	-			07/07/2021	1	07/07/2021	07/07/2021		07/07/2021	07/07/2021
Arsenic	mg/kg	4	Metals-020	<4	1	9	8	12	100	79
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	101	72
Chromium	mg/kg	1	Metals-020	<1	1	16	12	29	107	85
Copper	mg/kg	1	Metals-020	<1	1	14	13	7	108	101
Lead	mg/kg	1	Metals-020	<1	1	15	13	14	109	79
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	106	99
Nickel	mg/kg	1	Metals-020	<1	1	7	6	15	104	81
Zinc	mg/kg	1	Metals-020	<1	1	26	27	4	109	92

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	10	06/07/2021	06/07/2021		[NT]	[NT]
Date analysed	-			[NT]	10	07/07/2021	07/07/2021		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	10	7	5	33	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	10	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	10	15	10	40	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	10	18	16	12	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	10	13	12	8	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	10	17	6	96	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	10	54	22	84	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	273223-2
Date prepared	-			05/07/2021	1	05/07/2021	05/07/2021		05/07/2021	05/07/2021
Date analysed	-			05/07/2021	1	05/07/2021	05/07/2021		05/07/2021	05/07/2021
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	102	104

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			07/07/2021	6	06/07/2021	06/07/2021		07/07/2021	[NT]
Date analysed	-			07/07/2021	6	07/07/2021	07/07/2021		07/07/2021	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	6	7.1	7.0	1	101	[NT]
Chloride, Cl 1:5 soil:water	mg/kg	10	Inorg-081	<10	[NT]	[NT]	[NT]	[NT]	90	[NT]
Sulphate, SO4 1:5 soil:water	mg/kg	10	Inorg-081	<10	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	24	06/07/2021	06/07/2021		[NT]	[NT]
Date analysed	-			[NT]	24	07/07/2021	07/07/2021		[NT]	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	24	7.9	8.0	1	[NT]	[NT]

QUALITY CONTROL: ESP/CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	273223-19
Date prepared	-			08/07/2021	18	08/07/2021	08/07/2021		08/07/2021	08/07/2021
Date analysed	-			08/07/2021	18	08/07/2021	08/07/2021		08/07/2021	08/07/2021
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	18	1.4	1.5	7	113	#
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	18	0.2	0.2	0	123	109
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	18	3.6	3.8	5	116	#
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	18	0.98	1.1	12	126	126
ESP	%	1	Metals-020	[NT]	18	16	16	0	[NT]	[NT]

QUALITY CONTROL: Texture and Salinity*					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			07/07/2021	[NT]	[NT]	[NT]	[NT]	07/07/2021	[NT]
Date analysed	-			07/07/2021	[NT]	[NT]	[NT]	[NT]	07/07/2021	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	Inorg-002	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

ESP/CEC:
- # High spike recovery was obtained for this sample. The sample was re-digested and re-spiked and the high recovery was confirmed. This is suspected to be from matrix interferences. However, an acceptable recovery was obtained for the LCS.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 273223-10 for Cr, Ni and Zn. Therefore a triplicate result has been issued as laboratory sample number 273223-26.

Asbestos: A portion of the supplied samples were sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that these sub-samples are indicative of the entire sample.
Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 273223-1-2 were sub-sampled from jars provided by the client

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 273223-3-10 were sub-sampled from bags provided by the client.

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CERTIFICATE OF ANALYSIS 273223-A

Client Details

Client	Douglas Partners Pty Ltd (Riverstone)
Attention	Gavin Boyd
Address	43 Hobart St, Riverstone, NSW, 2765

Sample Details

Your Reference	**94624.01, The Ponds**
Number of Samples	additional analysis
Date samples received	02/07/2021
Date completed instructions received	13/07/2021

Analysis Details

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

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

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

Report Details

Date results requested by	15/07/2021
Date of Issue	15/07/2021

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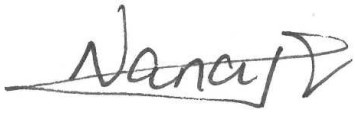
Results Approved By
Josh Williams, LC Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

PAHs in TCLP (USEPA 1311)		
Our Reference		273223-A-5
Your Reference	UNITS	BH205
Depth		0.1m
Date Sampled		29/06/2021
Type of sample		Soil
pH of soil for fluid# determ.	pH units	9.2
pH of soil TCLP (after HCl)	pH units	2.0
Extraction fluid used	-	1
pH of final Leachate	pH units	5.6
Date extracted	-	14/07/2021
Date analysed	-	14/07/2021
Naphthalene in TCLP	mg/L	<0.001
Acenaphthylene in TCLP	mg/L	<0.001
Acenaphthene in TCLP	mg/L	<0.001
Fluorene in TCLP	mg/L	<0.001
Phenanthrene in TCLP	mg/L	<0.001
Anthracene in TCLP	mg/L	<0.001
Fluoranthene in TCLP	mg/L	<0.001
Pyrene in TCLP	mg/L	<0.001
Benzo(a)anthracene in TCLP	mg/L	<0.001
Chrysene in TCLP	mg/L	<0.001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.002
Benzo(a)pyrene in TCLP	mg/L	<0.001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.001
Total +ve PAH's	mg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	93

Method ID	Methodology Summary
INORG-004	Toxicity Characteristic Leaching Procedure (TCLP) using Zero Headspace Extraction (zHE) using AS4439 and USEPA 1311.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
Org-022/025	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			14/07/2021	[NT]	[NT]	[NT]	[NT]	14/07/2021	[NT]
Date analysed	-			14/07/2021	[NT]	[NT]	[NT]	[NT]	14/07/2021	[NT]
Naphthalene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	83	[NT]
Acenaphthylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	68	[NT]
Fluorene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	80	[NT]
Phenanthrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	92	[NT]
Anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	76	[NT]
Pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	80	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	72	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	80	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	81	[NT]	[NT]	[NT]	[NT]	82	[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.

Ming To

From: Aileen Hie
Sent: Tuesday, 13 July 2021 2:33 PM
To: Ming To
Subject: FW: Results for Registration 273223 94624.01, The Ponds
Attachments: 273223-[R00].pdf; 273223-COC.pdf; Douglas_273223.xlsx; 94624.01 The Ponds.273223.header.xml; 94624.01 The Ponds.273223.Sample26.csv; 94624.01 The Ponds.273223.Chemistry26.csv; 273223.Excel.xlsx

Ref: 273223-A.
TAT: 2 days.
Due: 15/07/2021 MT

From: Gavin Boyd <Gavin.Boyd@douglaspartners.com.au>
Sent: Tuesday, 13 July 2021 2:12 PM
To: Aileen Hie <AHie@envirolab.com.au>; SydneyMailbox <Sydney@envirolab.com.au>
Subject: FW: Results for Registration 273223 94624.01, The Ponds

Hi Aileen,

Could you organise TCLP testing for PAH for BH205/0.1m – 2 day TAT (5)

Gavin Boyd | Senior Associate / Geotechnical Engineer
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
43 Hobart Street Riverstone NSW 2765 | PO Box 267 Riverstone NSW 2765
P: 02 4666 0450 | M: 0431 496 721 | E: Gavin.Boyd@douglaspartners.com.au

To find information on our COVID-19 measures, please visit douglaspartners.com.au/news/covid-19

From: Greta Petzold <GPetzold@envirolab.com.au>
Sent: Friday, 9 July 2021 3:01 PM
To: Gavin Boyd <Gavin.Boyd@douglaspartners.com.au>; Kristine Nicodemus <Kristine.Nicodemus@douglaspartners.com.au>
Subject: Results for Registration 273223 94624.01, The Ponds

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

Please note that a hard copy will not be posted.

Enquiries should be made directly to:
customerservice@envirolab.com.au

Douglas Partners
Geotechnics | Environment | Groundwater

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	94624.01	**Suburb:**	The Ponds	**To:**	Envirolab Services
Project Name:	Proposed New Buildings	**Order Number**			12 Ashley St Chatswood NSW 2067
Project Manager:	Gavin Boyd	**Sampler:**	Jeremie Young	**Attn:**	Aileen Hie
Emails:	gavin.boyd@douglaspartners.com.au	kristine.nicodemus@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: Combo 8A	Combo 3A	Combo 3	Chloride and Sulphate	Sodicity	pH, eCE & Textural classification	CEC & pH	TRH & BTEX		Notes/preservation
BH201/0.2m	1	29.6.21	S	G	•									No ziplock bag provided
BH202/0.2m	2	29.6.21	S	G	•									No ziplock bag provided
BH203/0-0.1m	3	29.6.21	S	G/P	•									
BH204/0.4-0.5m	4	29.6.21	S	G/P	•									
BH205/0.1m	5	29.6.21	S	G/P	•									
BH206/0-0.1m	6	29.6.21	S	G/P	•					•				
BH206/0.4-0.5m	7	29.6.21	S	G/P	•					•				
BH207/0-0.1m	8	29.6.21	S	G/P	•					•				
BH207/0.4-0.5m	9	29.6.21	S	G/P	•					•				
BH208/0.4-0.5m	10	29.6.21	S	G/P	•									
BH201/0.5m	11	29.6.21	S	G		•								
BH203/0.5-0.6m	12	29.6.21	S	G		•								
BH206/0.5-0.6m	13	29.6.21	S	G		•								
BD1/20210629	14	29.6.21	S	G			•							
BD2/20210629	15	29.6.21	S	G			•							
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:

Total number of samples in container: 24 **Relinquished by:** JY **Transported to laboratory by:**

Send Results to: Douglas Partners Pty Ltd **Address:** 43 Hobart St Riverstone NSW 2765 **Phone:** **Fax:**

Signed: **Received by:** TSHAW @ Envirolab **Date & Time:** 02-07-2021 1655

ENVIROLAB
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200
Job No: 273233
Date Received: 02-07-2021
Time Received: 1655
Received By: TSHAW
Temp: Cool/Ambient 5°C
Cooling: Ice/Icepack
Security: Intact/Broken/None

Douglas Partners
Geotechnics | Environment | Groundwater

PAGE 2/2

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	94624.01	**Suburb:** The Ponds	**To:** Envirolab Services
Project Name:	Proposed New Buildings	**Order Number**	12 Ashley St Chatswood NSW 2067
Project Manager:	Gavin Boyd	**Sampler:** Jeremie Young	**Attn:** Aileen Hie
Emails:	gavin.boyd@douglaspartners.com.au	kristine.nicodemus@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)	Analytes: Combo 8A	Combo 3A	Combo 3	Chloride and Sulphate	Sodicity	pH, eCE & Textural classification	CEC & pH	TRH & BTEX		Notes/preservation
	(16) (17) Trip spike/blank	~~16~~	28/6/21	S	G								•		
18	BH208/0.7-0.8m	~~17~~	29/6/21	S	P				•	•	•				
19	BH205/1m	~~18~~	29/6/21	S	P				•	•	•				
20	BH207/0.9-1m	~~19~~	29/6/21	S	P						•				
21	BH207/1.4-1.5m	~~20~~	29/6/21	S	P						•				
22	BH204/0-0.1m	~~21~~	29/6/21	S	P						•	•			
23	BH204/0.9-1m	~~22~~	29/6/21	S	P						•				
24	BH204/1.3-1.4m	~~23~~	29/6/21	S	G						•				
25	BH205/0.5m	~~24~~	29/6/21	S	P						•				
	BVN														
	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:

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

Send Results to: Douglas Partners Pty Ltd **Address:** 43 Hobart St Riverstone NSW 2765 **Phone:** **Fax:**

Signed: **Received by:** TSHAW@envirolab.syd **Date & Time:** 02-07-2021 1655

#

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

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd (Riverstone)
Attention	Gavin Boyd

Sample Login Details

Your reference	94624.01, The Ponds
Envirolab Reference	273223
Date Sample Received	02/07/2021
Date Instructions Received	02/07/2021
Date Results Expected to be Reported	09/07/2021

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	25 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	5
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

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

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBsin Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils	Misc Inorg - Soil	ESP/CEC	Texture and Salinity*
BH201-0.2m	✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH202-0.2m	✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH203-0-0.1m	✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH204-0.4-0.5m	✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH205-0.1m	✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH206-0-0.1m	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
BH206-0.4-0.5m	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
BH207-0-0.1m	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
BH207-0.4-0.5m	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓
BH208-0.4-0.5m	✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH201-0.5m	✓	✓	✓				✓		✓			
BH203-0.5-0.6m	✓	✓	✓				✓		✓			
BH206-0.5-0.6m	✓	✓	✓				✓		✓			
BD1/20210629	✓	✓	✓				✓					
BD2/20210629	✓	✓	✓				✓					
Trip Spike	✓											
Trip Blank	✓											
BH208-0.7-0.8m										✓	✓	✓
BH205-1m										✓	✓	✓
BH207-0.9-1m										✓		✓
BH207-1.4-1.5m										✓		✓
BH204-0-0.1m										✓	✓	✓
BH204-0.9-1m										✓		✓
BH204-1.3-1.4m										✓		✓
BH205-0.5m										✓		✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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 279047

Client Details

Client	Douglas Partners Pty Ltd
Attention	Gavin Boyd
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**94624.01, The Ponds**
Number of Samples	13 Soil
Date samples received	27/09/2021
Date completed instructions received	27/09/2021

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	27/09/2021
Date of Issue	27/09/2021

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

Results Approved By
Diego Bigolin, Inorganics Supervisor
Hannah Nguyen, Metals Supervisor
Josh Williams, LC Supervisor
Lucy Zhu, Asbestos Supervisor
Steven Luong, Organics Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		279047-1	279047-2	279047-3	279047-4	279047-5
Your Reference	UNITS	209	210	211	212	213
Depth		0-0.1	0-0.1	0-0.1	0.2-0.3	0.2-0.3
Date Sampled		27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Date analysed	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
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	%	92	87	83	79	95

svTRH (C10-C40) in Soil						
Our Reference		279047-1	279047-2	279047-3	279047-4	279047-5
Your Reference	UNITS	209	210	211	212	213
Depth		0-0.1	0-0.1	0-0.1	0.2-0.3	0.2-0.3
Date Sampled		27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Date analysed	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
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	110	<100	140	<100	<100
Total +ve TRH (C10-C36)	mg/kg	110	<50	140	<50	<50
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	110	<100	180	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	110	<50	180	<50	<50
Surrogate o-Terphenyl	%	63	72	72	72	71

PAHs in Soil						
Our Reference		279047-1	279047-2	279047-3	279047-4	279047-5
Your Reference	UNITS	209	210	211	212	213
Depth		0-0.1	0-0.1	0-0.1	0.2-0.3	0.2-0.3
Date Sampled		27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Date analysed	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
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	%	91	92	92	105	96

PAHs in Soil						
Our Reference		279047-6	279047-7	279047-8	279047-9	279047-10
Your Reference	UNITS	214	215	216	217	218
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Date analysed	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.06	<0.05	0.06	0.1	<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	0.06	<0.05	0.06	0.3	<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	%	91	83	84	89	93

PAHs in Soil				
Our Reference		279047-11	279047-12	279047-13
Your Reference	UNITS	219	220	221
Depth		0-0.1	0-0.1	0-0.1
Date Sampled		27/09/2021	27/09/2021	27/09/2021
Type of sample		Soil	Soil	Soil
Date extracted	-	27/09/2021	27/09/2021	27/09/2021
Date analysed	-	27/09/2021	27/09/2021	27/09/2021
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.2	<0.1
Pyrene	mg/kg	0.2	0.2	0.1
Benzo(a)anthracene	mg/kg	<0.1	0.1	<0.1
Chrysene	mg/kg	<0.1	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	0.3	<0.2
Benzo(a)pyrene	mg/kg	0.1	0.2	0.09
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.1	0.2	<0.1
Total +ve PAH's	mg/kg	0.52	1.5	0.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	91	89	82

Organochlorine Pesticides in soil						
Our Reference		279047-1	279047-2	279047-3	279047-4	279047-5
Your Reference	UNITS	209	210	211	212	213
Depth		0-0.1	0-0.1	0-0.1	0.2-0.3	0.2-0.3
Date Sampled		27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Date analysed	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
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	%	86	77	82	97	86

Organophosphorus Pesticides in Soil						
Our Reference		279047-1	279047-2	279047-3	279047-4	279047-5
Your Reference	UNITS	209	210	211	212	213
Depth		0-0.1	0-0.1	0-0.1	0.2-0.3	0.2-0.3
Date Sampled		27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Date analysed	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
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	%	86	77	82	97	86

PCBs in Soil						
Our Reference		279047-1	279047-2	279047-3	279047-4	279047-5
Your Reference	UNITS	209	210	211	212	213
Depth		0-0.1	0-0.1	0-0.1	0.2-0.3	0.2-0.3
Date Sampled		27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Date analysed	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
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	%	86	77	82	97	86

Acid Extractable metals in soil						
Our Reference		279047-1	279047-2	279047-3	279047-4	279047-5
Your Reference	UNITS	209	210	211	212	213
Depth		0-0.1	0-0.1	0-0.1	0.2-0.3	0.2-0.3
Date Sampled		27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Date analysed	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Arsenic	mg/kg	5	7	<4	<4	8
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	8	14	11	10	8
Copper	mg/kg	12	15	17	66	32
Lead	mg/kg	28	18	15	17	14
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	4	5	14	18
Zinc	mg/kg	42	43	76	77	54

Misc Soil - Inorg						
Our Reference		279047-1	279047-2	279047-3	279047-4	279047-5
Your Reference	UNITS	209	210	211	212	213
Depth		0-0.1	0-0.1	0-0.1	0.2-0.3	0.2-0.3
Date Sampled		27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Date analysed	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Moisture						
Our Reference		279047-1	279047-2	279047-3	279047-4	279047-5
Your Reference	UNITS	209	210	211	212	213
Depth		0-0.1	0-0.1	0-0.1	0.2-0.3	0.2-0.3
Date Sampled		27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Date analysed	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Moisture	%	15	11	10	18	12

Moisture						
Our Reference		279047-6	279047-7	279047-8	279047-9	279047-10
Your Reference	UNITS	214	215	216	217	218
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Date analysed	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Moisture	%	8.9	13	12	12	16

Moisture				
Our Reference		279047-11	279047-12	279047-13
Your Reference	UNITS	219	220	221
Depth		0-0.1	0-0.1	0-0.1
Date Sampled		27/09/2021	27/09/2021	27/09/2021
Type of sample		Soil	Soil	Soil
Date prepared	-	27/09/2021	27/09/2021	27/09/2021
Date analysed	-	27/09/2021	27/09/2021	27/09/2021
Moisture	%	18	11	15

Asbestos ID - soils						
Our Reference		279047-1	279047-2	279047-3	279047-4	279047-5
Your Reference	UNITS	209	210	211	212	213
Depth		0-0.1	0-0.1	0-0.1	0.2-0.3	0.2-0.3
Date Sampled		27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	27/09/2021	27/09/2021	27/09/2021	27/09/2021	27/09/2021
Sample mass tested	g	Approx. 25g	Approx. 35g	Approx. 30g	Approx. 60g	Approx. 45g
Sample Description	-	Brown fine-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
Asbestos comments	-	NO	NO	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Metals-020	Determination of various metals by ICP-AES.
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.
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.

Method ID	Methodology Summary
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-21	[NT]
Date extracted	-			27/09/2021	1	27/09/2021	27/09/2021		27/09/2021	[NT]
Date analysed	-			27/09/2021	1	27/09/2021	27/09/2021		27/09/2021	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	83	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	83	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	85	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	79	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	85	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	84	[NT]
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	86	[NT]
naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	95	1	92	84	9	85	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-21	[NT]
Date extracted	-			27/09/2021	1	27/09/2021	27/09/2021		27/09/2021	[NT]
Date analysed	-			27/09/2021	1	27/09/2021	27/09/2021		27/09/2021	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	101	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	93	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	110	100	10	119	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	101	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	110	110	0	93	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	119	[NT]
Surrogate o-Terphenyl	%		Org-020	90	1	63	62	2	112	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-21	[NT]
Date extracted	-			27/09/2021	1	27/09/2021	27/09/2021		27/09/2021	[NT]
Date analysed	-			27/09/2021	1	27/09/2021	27/09/2021		27/09/2021	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	107	[NT]
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	111	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	109	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	[NT]
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	137	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	111	[NT]
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	103	[NT]
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	104	[NT]
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	128	1	91	86	6	123	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-21	[NT]
Date extracted	-			27/09/2021	1	27/09/2021	27/09/2021		27/09/2021	[NT]
Date analysed	-			27/09/2021	1	27/09/2021	27/09/2021		27/09/2021	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	102	[NT]
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	103	[NT]
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	91	[NT]
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	107	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	[NT]
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	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	98	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	107	[NT]
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	94	[NT]
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	84	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	120	1	86	85	1	122	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-21	[NT]
Date extracted	-			27/09/2021	1	27/09/2021	27/09/2021		27/09/2021	[NT]
Date analysed	-			27/09/2021	1	27/09/2021	27/09/2021		27/09/2021	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	62	[NT]
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	110	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	61	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	63	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	62	[NT]
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	72	[NT]
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	120	1	86	85	1	122	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-21	[NT]
Date extracted	-			27/09/2021	1	27/09/2021	27/09/2021		27/09/2021	[NT]
Date analysed	-			27/09/2021	1	27/09/2021	27/09/2021		27/09/2021	[NT]
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	100	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	120	1	86	85	1	122	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			27/09/2021	1	27/09/2021	27/09/2021		27/09/2021	[NT]
Date analysed	-			27/09/2021	1	27/09/2021	27/09/2021		27/09/2021	[NT]
Arsenic	mg/kg	4	Metals-020	<4	1	5	5	0	91	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	90	[NT]
Chromium	mg/kg	1	Metals-020	<1	1	8	9	12	95	[NT]
Copper	mg/kg	1	Metals-020	<1	1	12	11	9	91	[NT]
Lead	mg/kg	1	Metals-020	<1	1	28	29	4	97	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	88	[NT]
Nickel	mg/kg	1	Metals-020	<1	1	4	3	29	93	[NT]
Zinc	mg/kg	1	Metals-020	<1	1	42	37	13	92	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			27/09/2021	1	27/09/2021	27/09/2021		27/09/2021	[NT]
Date analysed	-			27/09/2021	1	27/09/2021	27/09/2021		27/09/2021	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	90	[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 requested for asbestos testing were sub-sampled from bags provided by the client.

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	94624.01	**Suburb:**	The Ponds	**To:**	Envirolab Services
Project Manager:	G Boyd	**Order Number:**		**Sampler:** G Boyd	12 Ashley Street, Chatswood, NSW 2067
Email:	gavin.boyd@douglaspartners.com.au			**Attn:**	Aileen Hie
Turnaround time:	☐ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☑ Same day			**Contact:**	02 9910 6200 Ahie@envirolab.com.au
Prior Storage:	☑ Fridge ☐ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No ☐ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Combo 8a	PAH	TRH/ BTEX	OCP/OPP/ PCB	Phenols	Asbestos (AS)	Asbestos (NEPM)	PFAS	pH, CEC			Notes/ Preservation/ Additional Requirements
1	209	0	0.1	27/09/21	S	G/P	•											
2	210	0	0.1	27/09/21	S	G/P	•											
3	211	0	0.1	27/09/21	S	G/P	•											
4	212	0.2	0.3	27/09/21	S	G/P	•											
5	213	0.2	0.3	27/09/21	S	G/P	•											
6	214	0	0.1	27/09/21	S	G/P		•										
7	215	0	0.1	27/09/21	S	G/P		•										
8	216	0	0.1	27/09/21	S	G/P		•										
9	217	0	0.1	27/09/21	S	G/P		•										
10	218	0	0.1	27/09/21	S	G/P		•										
11	219	0	0.1	27/09/21	S	G/P		•										
12	220	0	0.1	27/09/21	S	G/P		•										
13	221	0	0.1	27/09/21	S	G/P		•										

Chatswood NSW
Ph: (02) 9910 6200
Job No. 279047
Date Received: 27/9/21
Time Received: 1400
Received By: VV
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact

Metals to analyse:	HM9 (As, Cd, Cr, Cu, Pb, Hg, Mn, Ni, Zn)		
Number of samples in container:		**Transported to laboratory by:**	Hunter Express
Send results to:	Douglas Partners Pty Ltd		
Address:	96 Hermitage Rd, West Ryde, 2114	**Phone:**	02 9809 0666
Relinquished by:		**Date:**	**Signed:**

LAB RECEIPT

Lab Ref. No:	279047
Received by:	V. VEGA
Date & Time:	27/9/21 @ 1400
Signed:	

Appendix J

Quality Assurance and Quality Control

Appendix J
Quality Assurance and Quality Control
85 The Ponds Boulevard, The Ponds

J1.0 Field and Laboratory Data Quality Assurance and Quality Control

The field and laboratory data quality assurance and quality control (QA/QC) procedures and results are summarised in the following Table 1. Reference should be made to the field work methodology and the laboratory results / certificates of analysis for further details. The relative percentage difference (RPD) results, along with the other filed QC samples are included at the end of this appendix in Table QA1.

Table 1: Field and Laboratory Quality Control

Item	Evaluation / Acceptance Criteria	Compliance
Analytical laboratories used	NATA accreditation	C
Holding times	Various based on type of analysis	C
Intra-laboratory replicates	10% of primary samples; <30% RPD	PC
Trip Spikes	1 per sampling event; 60-140% recovery	C
Trip Blanks	1 per sampling event; <PQL	C
Laboratory / Reagent Blanks	1 per batch; <PQL	C
Matrix Spikes	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Surrogate Spikes	All organics analysis; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Control Samples	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Standard Operating Procedures (SOP)	Adopting SOP for all aspects of the sampling field work	C

Notes:
C = compliance; PC = partial compliance; NC = non-compliance

The RPD results were all within the acceptable range, with the exception of those indicated in Table QA1. The exceedances are not, however, considered to be of concern given that:

- The typically low actual differences in the concentrations of the replicate pairs where some RPD exceedances occurred;
- The number of replicate pairs being collected from fill soils which by its nature is heterogeneous;

- Replicates, rather than homogenised duplicates, were used to minimise risk of volatile loss, hence greater variability can be expected;
- Most of the recorded concentrations being relatively close to the PQL;
- The majority of RPDs within a replicate pair being within the acceptable limitsand
- All other QA/QC parameters met the DQIs.

In summary, the QC data is determined to be of sufficient quality to be considered acceptable for the assessment.

J2.0 Data Quality Indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQIs) as outlined in NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013):

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

Table 2: Data Quality Indicators

Data Quality Indicator	Method(s) of Achievement
Completeness	Systematic and selected target locations sampled.
	Preparation of borehole logs, sample location plan and chain of custody records.
	Preparation of field sampling sheets.
	Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody.
	Samples analysed for contaminants of potential concern (COPC) identified in the conceptual site model (CSM).
	Completion of chain of custody (COC) documentation.
	NATA accredited laboratory results certificates provided by the laboratory.
	Satisfactory frequency and results for field and laboratory quality control (QC) samples as discussed in Section 1.
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project.
	Experienced sampler(s) used.
	Use of NATA registered laboratories, with test methods the same or similar between laboratories.
	Satisfactory results for field and laboratory QC samples.
Representativeness	Target media sampled.
	Sample numbers recovered and analysed are considered to be representative of the target media and complying with DQOs.
	Samples were extracted and analysed within holding times.
	Samples were analysed in accordance with the COC.
Precision	Field staff followed standard operating procedures.
	Acceptable RPD between original samples and replicates.
	Satisfactory results for all other field and laboratory QC samples.
Accuracy	Field staff followed standard operating procedures.
	Satisfactory results for all field and laboratory QC samples.

Based on the above, it is considered that the DQIs have been generally complied with.

J3.0 Conclusion

Based on the results of the field QA and field and laboratory QC, and evaluation against the DQIs it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

J4.0 References

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM].* Australian Government Publishing Services Canberra: National Environment Protection Council.

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Table QA1: Relative Percentage Difference Results – Intra-laboratory Replicates

			Metals								TRH						BTEX							PAH				Phenol	OCP										OPP	PCB							
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Inorganic Mercury (Hg2+)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	TRH >C10-C16 less Naphthalene	TRH >C16-C34	TRH >C34-C40	Benzene	Benzene	Toluene	Toluene	Ethylbenzene	Ethylbenzene	Total Xylenes	Naphthalene [3]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs	Phenol	DDD	DDT+DDE+DDD [1]	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Heptachlor	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyrifos	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
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	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
BH202210828	0 m	29-Jan-21	6	<0.4	10	9	12	<0.1	4	21	<25	<50	<25	<50	<100	<100	<0.2	NT	<0.5	NT	<1	NT	<1	<1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
BH206	0 - 0.1 m	29-Jan-21	7	<0.4	12	12	15	<0.1	6	27	<25	<50	<25	<50	<100	<100	<0.2	NT	<0.5	NT	<1	NT	<1	<1	<0.05	<0.5	<0.05	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		Difference	1	0	2	3	3	0	2	6	0	0	0	0	0	0	0	-	0	-	0	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		RPD	10%	0%	18%	29%	22%	0%	**40%**	25%	0%	0%	0%	0%	0%	0%	0%	-	0%	-	0%	-	0%	0%	0%	0%	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD102210828	0 m	29-Jan-21	8	<0.4	12	9	10	<0.1	3	18	<25	<50	<25	<50	<100	<100	<0.2	NT	<0.5	NT	<1	NT	<1	<1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
BH207	0 - 0.1 m	29-Jan-21	5	<0.4	9	5	10	<0.1	4	15	<25	<50	<25	<50	<100	<100	<0.2	NT	<0.5	NT	<1	NT	<1	<1	<0.05	<0.5	<0.05	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		Difference	3	0	3	4	0	0	1	4	0	0	0	0	0	0	0	-	0	-	0	-	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		RPD	**46%**	0%	29%	**57%**	0%	0%	29%	18%	0%	0%	0%	0%	0%	0%	0%	-	0%	-	0%	-	0%	0%	0%	0%	0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD102020801	0 m	01/08/2020	5	<0.4	12	16	20	<0.1	7	36	<25	<50	<25	<50	<100	<100	<0.2	NT	<0.5	NT	<1	NT	<1	<1	<0.05	<0.5	<0.05	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
103	0 - 0.1 m	02/08/2020	7	<0.4	10	13	17	<0.1	9	27	<25	<50	<25	<50	<100	<100	<0.2	NT	<0.5	NT	<1	NT	<1	<1	0.06	<0.5	0.3	<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	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
		Difference	2	0	3	5	3	0	1	11	0	0	0	0	0	0	0	-	0	-	0	-	0	0	0.01	0	0.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
		RPD	**33%**	0%	23%	**32%**	16%	0%	15%	**34%**	0%	0%	0%	0%	0%	0%	0%	-	0%	-	0%	-	0%	0%	18%	0%	**143%**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-