Douglas PARTNERS

GROUNDED EXPERTISE

Report on Detailed Site Investigation

Indigenous Centre of Excellence

171 Victoria Road, Parramatta NSW

Prepared for Western Sydney University

Project 227190.01

28 March 2025

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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.

Signature		Date
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Douglas Partners acknowledges Australia's First Peoples as the Traditional Owners of the Land and Sea on which we operate. We pay our respects to Elders past and present and to all Aboriginal and Torres Strait Islander peoples across the many communities in which we live, visit and work. We recognise and respect their ongoing cultural and spiritual connection to Country.

Executive Summary

Douglas Partners Pty Ltd (Douglas) has been engaged by Western Sydney University to prepare this Detailed Site Investigation (DSI) for an indigenous centre of excellence (ICoE) located at 171 Victoria Road, Parramatta NSW (the 'site').

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. This report responds to the SSD-64916225 Secretary's Environmental Assessment Requirement (SEARs) number #17 Contamination and Remediation, which was issued by the Department of Planning, Housing and Infrastructure on 21st November 2023.

The scope of the investigation comprised review of previous reports, opportunistic collection of samples from a concurrent geotechnical investigation and intrusive testing from additional environmental test locations.

Based on the observations at the time of the investigation and the analytical results reported herein, the following is summarised:

- no exceedances of the adopted site assessment criteria (SAC) protective of human health for the proposed land were identified. Exceedances of ecological based SAC for polycyclic aromatic hydrocarbons (PAH) (as benzo(a)pyrene) are not considered to be significant based on consideration of higher reliability screening levels and the nature of the proposed development;
- no future groundwater assessment is required for site assessment (contamination) purposes;
- no asbestos was observed during the investigation or detected by laboratory analysis. However, based on limitations of the investigation methods it is considered that there is a potential that unidentified asbestos may be present in the fill between sampling points and in untested parts of the site;
- the fill within the site is preliminarily classified as general solid waste (non-putrescible), excluding areas of elevated PAHs, which are preliminarily classified as restricted solid waste (non-putrescible). Additional discussion is presented herein for further assessment options; and
- the natural soil (which underlies the fill) does not appear to have been significantly impacted by chemical residues / processes. However, further inspection / testing is required for classification of natural materials prior to disposal.

It is considered that the site is suitable for the proposed university development subject to implementation of the following recommendations:

- undertaking a formal waste classification either ex-situ (preferred), or alternatively and if limited by spatial / time constraints, *in-situ* (using test pits) following the removal of the overlying asphalt; and
- preparation and implementation of an unexpected finds protocol which outlines appropriate response procedures to be undertaken by the development contractor in the event suspected contamination (eg asbestos) is encountered during the redevelopment of the site.

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Report on Detailed Site Investigation
Indigenous Centre of Excellence
171 Victoria Road, Parramatta NSW

1. Introduction

Douglas Partners Pty Ltd (Douglas) has been engaged by Western Sydney University to prepare this Detailed Site Investigation (DSI) for an indigenous centre of excellence (ICoE) located at 171 Victoria Road, Parramatta NSW (hereinafter referred to as the 'site'). The site location and layout is shown on Drawing 1, Appendix A.

The DSI was undertaken in general accordance with Douglas' proposal 227190.00.P.001.Rev1 dated 28/02/2024.

It is understood that the ICoE project is a state significant development (SSD), and as such, 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 satisfy the Planning Secretary's Environment Assessment Requirements (SEARs) and relevant guidelines.

A preliminary site investigation (PSI) was previously undertaken for the site by JK Environments (JKE) (2023) and is summarised in Section 6. A geotechnical investigation is also being undertaken by Douglas concurrently to this DSI and will be reported under separate cover (Douglas reference 22719.00.R.001.Rev2).

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

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

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

2. Proposed development

The proposed development is understood to comprise the construction of a new state-of-the-art Indigenous Centre of Excellence as a new tertiary education facility on campus. The Indigenous Centre of Excellence project is funded by the NSW Government's Western Sydney Infrastructure Grants Program in association with Western Sydney University. The new Indigenous Centre of Excellence will be an important asset for both the University and local community alike, providing a space for the commitment to advancing Indigenous education, leadership, and reconciliation. The Indigenous Centre of Excellence will stand as a symbol of recognition of Indigenous land and the University's relationship with Indigenous communities. The Indigenous Centre of Excellence will represent a celebration of tens of thousands of years of Indigenous knowledges and histories,

a legacy that the University is honoured to nurture and promote through further education opportunities for students and communities.

Through the Indigenous Centre of Excellence, the University will aim to drive positive change, increase Indigenous participation in higher education, and contribute to the preservation and sharing of Indigenous cultures.

This State Significant Development Application (SSDA) specifically seeks detailed approval for the following works:

- site preparation including demolition of the existing car park, tree removal and installation of inground utility infrastructure services.
- construction of a four-storey Indigenous Centre of Excellence encompassing:
    - ground level facilities, including but not limited to, a dedicated arrival area, outdoor amphitheatre, cinema and lecture theatre, performance space, artist studios and exhibition space. Associated workspaces, meeting areas, lounge areas and other amenities are to be provided throughout the ground floor;
    - first floor level upwards comprising dedicated educational facilities including library facilities, learning areas and teaching spaces;
    - second floor level comprising staff / student foyer, offices, meeting rooms and collaboration spaces;
    - third level comprising a multi-functional recreational sports court, with associated ancillary amenities, alongside an astronomy garden and BBQ area; and
    - roof level plant and services.
- construction of internal driveway with hardstand area to provide 13 car parking spaces; and
- landscaping works to provide outdoor educational and recreational spaces.

This report responds to the SSD-64916225 Secretary's Environmental Assessment Requirement (SEARs) number #13 which was issued by the Department of Planning, Housing and Infrastructure on 21st November 2023.

Relevant updated proposed development drawings are included in Appendix A.

3. Scope of work

The scope of work for the current investigation comprised the following:

- review of relevant reports previously prepared for the site;
- a review of topographical, geological, soils and acid sulfate soil maps;
- a site walkover to observe current site features and assess potential contamination sources and receptors;
- opportunistic collection of environmental soil samples from six boreholes (BH01 to BH06) that were drilled for the concurrent geotechnical investigation. The samples were collected at regular depth intervals, changes in strata and / or upon apparent signs of potential contamination (e.g., staining or odours);

- drilling of 15 additional boreholes using a drill rig and excavator (with auger attachment), to depths of up to 2.2 m and collection of soil samples as above;
- field testing of recovered replicate soil samples using a photo-ionisation detector (PID) to screen for volatile organic compounds (VOC);
- industry standard quality control (QC) testing including collection of additional samples (field duplicate samples);
- analysis of selected soil samples at a National Association of Testing Authorities (NATA) accredited laboratory for a combination of the following contaminants of potential concern (CoPC):
    - metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc);
    - total recoverable hydrocarbon (TRH);
    - benzene, toluene, ethylbenzene and xylenes (BTEX);
    - polycyclic aromatic hydrocarbons (PAH);
    - polychlorinated biphenyls (PCB);
    - organochlorine pesticides (OCP);
    - organophosphorus pesticides (OPP);
    - phenols;
    - per- and polyfluoroalkyl substances (PFAS);
    - asbestos (identification in soils);
    - asbestos fines and fibrous asbestos (AF / FA);
    - cation exchange capacity (CEC);
    - pH; and
    - toxicity characteristic leaching procedure (TCLP).
- preparation of this DSI report.

4. Site information

Site address	171 Victoria Road, Parramatta NSW
Legal description	Part of Lot 100 DP816829
Area	Approximately 0.7 ha
Zoning	Zone SP2 Infrastructure – Educational Establishment
Local Council Area	City of Parramatta
Current use	Carpark

Surrounding uses	North – Victoria Road, followed by low density residential. East – Railway Street, followed by Vineyard Creek and low-density residential and commercial. South – Fifth Street, followed by open recreational space and several low-rise buildings (part of Western Sydney University campus). West – Facilities / plant room associated with the WSU campus, then Bridge Street, followed by an open space park (part of the WSU campus) and James Ruse Drive.

The site boundary is shown on Figure 1.

Figure 1: Photograph of site boundary (red line)

5. Environmental setting

5.1 Topography

The regional topography appears to generally slope south towards the Parramatta River, except for the WSU campus directly south of the site, which appears to have been built up forming a local floodplain at the site.

The site topography appears to be relatively flat at 10 m Australian Height Datum (AHD) and sloping to 8 m AHD in the south-west corner.

5.2 Soil landscape

Reference to the Sydney 1:100 000 Soils Landscape Sheet shows that the site crosses the boundary of Birrong fluvial (northern portion of the site) and Blacktown residual soils (southern portion of the site). The Birrong fluvial soil landscape typically comprises soils associated with current / former floodplains with shallow silty / sandy clay soil mixtures and deeper clays. The Blacktown residual soils are typically associated with low undulating rises (with the Birrong group associated with nearby drainage depressions) and comprises silty clays / clays associated with underlying Wianamatta group shales.

5.3 Site geology

Reference to the Sydney 1:100 000 Geology indicates Sheet that the site is underlain by Quaternary sediments in the eastern portion of the site, and Hawkesbury Sandstone in the western portion of the site. Quaternary sediments typically comprise silty to clayey sand, silt and clay with cementation in places. Hawkesbury Sandstone typically comprises medium to coarse grained quartz sandstone, very minor shale and laminite lenses.

5.4 Acid sulfate soils

The site is mapped to be within 300 m of an area of high probability of occurrence of ASS, likely related to Vineyard Creek, however, the site itself sits within an area of 'no known occurrence' of ASS.

With reference to the Parramatta Local Environmental Plan (LEP) (2011), the site is located within 'Class 5' land. For 'Class 5' land, development consent is required for works within 500 m of adjacent Class 1, 2, 3, or 4 land that is below 5 m AHD and by which the watertable is likely to be lowered below 1 m AHD.

5.5 Surface water and groundwater

The nearest surface water body to the site is Vineyard Creek, which is located within 50 m east of the site, which eventually flows south into the Parramatta River. Surface water flows are anticipated to be intercepted by local stormwater systems.

A search of the publicly available registered groundwater bore database indicated that there are 13 registered groundwater bores within a 500 m radius of the site. These bores are summarised in Table 1.

Table 1: Summary of available information from nearby registered groundwater bores

Bore ID	Authorised purpose	Completion year	Location relative to site	Final depth (m)	Standing water level (m bgl)
GW111347	Monitoring bore	2010	175 m south-west	6.0	3.21
GW111348	Monitoring bore	2010	165 m south-west	6.0	-
GW111349	Monitoring bore	2010	190 m south-west	6.0	2.68
GW114764	Monitoring bore	2011	475 m west	5.0	-

Bore ID	Authorised purpose	Completion year	Location relative to site	Final depth (m)	Standing water level (m bgl)
GW114765	Monitoring bore	2011	450 m west	6.0	-
GW114766	Monitoring bore	2011	430 m west	4.5	-
GW114767	Monitoring bore	2011	440 m west	4.0	-
GW114768	Monitoring bore	2001	440 m west	5.20	-
GW114769	Monitoring bore	2011	470 m west	6.0	-
GW114770	Monitoring bore	2011	445 m west	5.2	-
GW114771	Monitoring bore	2011	460 m west	5.7	-
GW112162	Monitoring bore	2002	430 m south-west	5.5	-
GW112161	Monitoring bore	2002	495 m south-west	3.5	-

A cluster of eight monitoring bores (GW114764 to GW114771) are located at United Petroleum Rydalmere (262 Victoria Road, Rydalmere) to the west of the site. Given this property is located approximately 450 m west of the site, and that groundwater flow from the petrol station would likely flow into Subiaco Creek, any potential impacts from the petrol station (i.e., spills and leaks) are unlikely to have an impact on the site.

The remainder of the monitoring bores appear to be associated with various properties in the industrial area located to the west of the site. Given the groundwater from the industrial area would not intercept the site (i.e., downgradient of the site), it is unlikely that any potential issues would impact on the site.

Based on the regional topography and the inferred flow direction of nearby water courses, the anticipated flow direction of groundwater beneath the site is to the west and south-west, towards Vineyard Creek, the likely receiving surface water body for the groundwater flow path, which would likely flow into the Parramatta River. Given the local geology (i.e., Hawkesbury Sandstone), the groundwater in the fractured rock beneath the site is anticipated to be relatively fresh.

6. Preliminary site investigation (JKE, 2023)

A PSI was previously undertaken by JKE (2023) and comprised a review of site information (background and site history) and a site walkover with the aim of identifying potentially contaminative activities at the site, identify the potential for site contamination, and assess the need for further investigation.

6.1 Summary of historical information

A review of the historical aerial photographs, historical maps, and historical land title records suggested that the site had been used as a recreational and vacant area which formed part of a larger property used as a hospital from 1897 until 1943. Substantial filling occurred in the southern portion of the site to infill the former creek between 1943 and 1951 and continued to be used for recreational purposes (tennis courts and bowling greens) until 1994. Recreational land uses

appeared to have ceased by 1994 where buildings, bowling greens and tennis courts were demolished and some filling / recontouring of the land likely occurred. The site had been redeveloped by 2000 and included a carpark associated with the WSU campus.

The following is noted and summarised from various records obtained by JKE for the site and surrounds:

- Council records under an informal access to information request. JKE considered none of the records to be relevant;
- SafeWork NSW records were not available at the time of preparing the PSI; and
- no records relating to the site or wider WSU property were noted in the NSW EPA and Department of Defence databases.

6.2 Summary of conceptual site model

JKE (2023) noted the following potential contamination sources and areas of concern (AEC):

- **Fill material:** The site appears to have been historically filled to achieve the existing levels and may have been imported from various sources;
- **Use of pesticides:** Pesticides may have been used beneath the former buildings and / or around the site when maintaining previous recreational facilities; and
- **Hazardous building materials (HBM):** HBM may be present as a result of former building and demolition activities.

Based on a site inspection and historical assessment, JKE noted that there is a low potential for the site have been used for activities associated with point sources of PFAS and is not considered to be CoPC in the context of the PSI (JKE, 2023).

The JKE report noted the following data gaps:

- SafeWork NSW – A search of SafeWork NSW was underway and were not available at the date of the PSI provided to Douglas; and
- sampling / analysis of media – Sampling and analysis of media was not undertaken and were provided in the recommendations.

6.3 Summary of conclusions and recommendations

JKE noted that the historical land uses and potential sources of contamination would not preclude the proposed development and that contamination would not be expected to pose a significant constraint to the proposed development.

JKE (2023) provided the following recommendations to better assess the risks associated with potential contamination:

- a sampling, analysis and quality plan (SAQP) should be prepared for the DSI;
- the DSI is to be undertaken to establish whether the site is suitable for the proposed development, or whether the site needs to be remediated;
- if the DSI identifies a need for remediation, a Remediation Action Plan (RAP) should also be prepared; and

- a waste classification be undertaken concurrently with the DSI to classify material to be excavated for the proposed development.

7. Site walkover

A site walkover was undertaken by a Douglas environmental engineer on 2 and 24 of March 2024. The general site topography appeared to be consistent with that described in Section 5.1. The site layout appears to have remained largely unchanged since the aerial photograph dated 2023. The following key site features pertinent to the investigation were observed (refer to photographs in Appendix C).

- at the time of the walkover, the site comprised a carpark located within the WSU campus. Access to the carpark was in the southern end of the site, which sloped down into the site (Photographs 1 to 4);
- the entirety of the site was covered in asphalt which appeared to be in moderate to good condition. Some cracks were apparent throughout the site (Photographs 1 to 3);
- a grass bank / short brick retaining wall surrounded the site (just outside the site boundary) and was elevated compared to site levels (Photographs 4 and 5);
- the site levels appeared relatively flat, however, appeared to be lowered compared its surroundings; and
- a gas cogeneration plant with a substation and transformer was located adjacent to the west of the site (Photographs 5 to 7).

8. 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 may become contaminated and how potential receptors may be exposed to contamination either in the present or the future i.e., it enables an assessment of the potential source – pathway – receptor linkages (complete pathways).

Based on the current investigation and the PSI (JKE, 2023), the following potential sources of contamination and associated contaminants of potential concern (CoPC) have been identified and are summarised in Table 2.

Table 2: Summary of potential sources

Potential sources and associated CoPC
On site sources
S1: Fill: Associated with filling and levelling of the site, particularly in the southern end where deeper fill is expected in the vicinity of the former creek Various CoPC and may include metals, TRH, BTEX, PAH, PCB, OCP, phenols and asbestos. **S2:** Use of pesticides CoPC include metals and OCPs and OPPs.

Potential sources and associated CoPC
On site sources
S3: Hazardous building material as a result of former building and demolition activities. CoPC include asbestos, lead (jn paint) and PCBs.

The following potential human and environmental receptors, along with relevant potential pathways, have been identified and summarised in Table 3.

Table 3: Summary of potential receptors and pathways

Potential human receptors
HR1: Current users [carparking] **HR2:** Construction and maintenance workers **HR3:** End users [tertiary education] **HR4:** Adjacent site users [tertiary education, residential, and commercial]
Potential environmental receptors
ER1: Surface water [Vineyard Creek] **ER2:** Groundwater **ER3:** Terrestrial ecosystems
Potential pathways to human receptors
HP1: Ingestion and dermal contact **HP2:** Inhalation of dust and/or vapours
Potential pathways to environmental receptors
EP1: Surface water run-off **EP2:** Leaching of contaminants and vertical migration into groundwater **EP3:** Lateral migration of groundwater providing base flow to water bodies **EP4:** Inhalation, ingestion and absorption

Summary of potentially complete exposure pathways

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The possible pathways between the above sources (S1 to S3) and receptors are provided in below Table 4.

Table 4: Summary of potentially complete exposure pathways

Source and CoPC	Exposure pathway	Receptor	Risk management action
S1: Fill: metals, PFAS, TRH, BTEX, PAH, PCB, OCP, phenols and asbestos **S2:** Pesticides: metals, OPPs, and OCPs. **S3:** Hazardous building materials: asbestos, lead (in paint) and PCBs.	**HP1:** Ingestion and dermal contact **HP2:** Inhalation of dust and/or vapours	**HR1:** Current users [carparking] **HR2:** Construction and maintenance workers **HR3:** End users [tertiary education]	An intrusive investigation is recommended to assess possible contamination including testing of the soils, soil vapour and groundwater.
	HP2: Inhalation of dust and/or vapours	**HR4:** Adjacent site users [tertiary education, residential, and commercial]	
	EP1: Surface water run-off **EP3:** Lateral migration of groundwater providing base flow to water bodies	**ER1:** Surface water [Vineyard Creek]	
	EP2: Leaching of contaminants and vertical migration into groundwater	**ER2:** Groundwater	
	EP4: Inhalation, ingestion and absorption	**ER3:** Terrestrial ecosystems	

9. Sampling plan

9.1 Data quality objectives

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

9.2 Soil sampling rationale

Based on the CSM and data quality objectives (DQO) the following sampling rationale was adopted.

An opportunistic and systematic sampling strategy based on NSW EPA *Contaminated Sites, Sampling Design Guidelines* (NSW EPA, 2022) to determine borehole locations. Table 2 of NSW EPA (2022) recommends a minimum of 19 sampling points for a site of approximately 0.7 ha for site characterisation based on the detection of circular hot spots using a systemic grid sampling pattern. It is noted that no points of interest were noted in the PSI, or observed during the

walkover, to validate targeted sampling locations. Therefore, the rationale behind the sampling locations was as follows.

Boreholes BH01 to BH06	Opportunistic sampling from the concurrent geotechnical investigation
Boreholes BH07 to BH21	Evenly spread across the site to provide systematic coverage and satisfy NSW EPA (2022) minimum recommended sampling points.

The borehole locations are shown on Drawing 1, in Appendix A.

Soil samples were collected from each borehole at just below the asphalt, and depths of approximately 0.5 m, 1.0 m and every 0.5 m thereafter, and changes in lithology or apparent signs of potential contamination.

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

10. **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 commercial / industrial land use scenario. The derivation of the SAC is provided in Appendix F and the adopted SAC are listed on the summary analytical results tables provided in Appendix G.

It is noted that while the proposed development comprises the construction of a building for a university, the adopted of a generic commercial / industrial land use scenario is considered most appropriate to represent the land use based on the following:

- the proposed development would be used in a university context where staff (e.g., teachers and / or maintenance staff) would likely have a longer potential exposure scenario (e.g., up to the 30 years over the course of a working career, as per assumptions for workers set out in NEPC (2013)), as compared to students who will likely only be exposed for a shorter duration (reasonably less than 10 to15 years for typical tertiary degree lengths). Exposure frequency of the staff would be that of a typical worker (i.e., eight hours per day, 240 days per year);
- the proposed development is anticipated to occupy most of the site, thus, limiting the site users' access to open landscaped areas on the site. The recommended NEPC (2013) land-use category for secondary schools (most like tertiary education) comprises a recreational land-use scenario, which therefore would not be representative;
- other land-use scenarios e.g., high-density residential B, which can constitute a scenario for limited access to soils, assumes people living at the site and therefore is not representative of the site usage; and

- given the university context, the general population of users would be adults and although children would be welcome on an intermittent basis (Special events), it is unlikely that children would visit frequently.

11. Results

11.1 Field work results

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

ASPHALT:	At all locations, to an approximate depth of 0.025 m below ground level (bgl).
Fill / Gravelly SAND:	At all locations, typically dark grey and pale brown, fine to coarse sand, fine to coarse, igneous gravel with trace asphalt fragments, to depths of between 0.2 and 0.4 m bgl.
Fill / Silty SAND:	At BH08, BH13, BH16, BH18, and BH21, typically pale grey, brown and dark brown, with trace gravel (igneous and sandstone), to depths of 0.4 to 1.0 m bgl.
Fill / Sandy CLAY / Silty CLAY / CLAY:	At most locations (except BH07, BH11, BH12, and BH18), typically dark brown to pale brown, dark yellow-brown and pale grey to dark grey, low to medium plasticity clay, with varying proportions of gravel (igneous, siltstone and iron cemented stone) (not all locations), trace asphalt fragments and rootlets (not all locations).
Fill / SAND:	At BH20, dark grey, brown, with bitumen fragments, to 1.3 m bgl.
CLAY / Silty CLAY:	Natural clay at all locations, typically brown / dark brown mottled red-brown, medium to high plasticity, with trace iron cemented stone (associated with alluvial layer), or grey / pale grey and red-brown, medium to high plasticity, with trace iron cemented stone (associated with a deeper residual layer). Trace inclusions of siltstone gravel and rootlets were noted

No apparent visual or olfactory evidence (e.g., staining, odours or free phase product) was observed during the investigations to suggest the presence of contamination within the soils at the site, however, a slight sulfuric odour was noted in the natural clay layer (alluvial) at BH19 and BH20.

The PID screening recorded generally low values with a maximum of 4 ppm suggesting the absence, or very low concentrations, of VOC in the samples tested.

No free groundwater was observed during excavation of test pits or drilling of boreholes. It should be noted that groundwater levels are affected by climatic conditions and soil permeability and will therefore vary with time.

11.2 Laboratory analytical results

The results of laboratory analysis are summarised in the following tables provided in Appendix G:

- Table G1: Summary of Laboratory Results – Soil;
- Table G2: Summary of Laboratory Results – Waste Classification;

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

11.3 Data quality assurance and quality control

The data quality assurance and quality control (QA / QC) results are provided 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.

12. Discussion

12.1 Soils

No exceedances of health-based SAC were reported.

The analytical results for BTEX, phenols, OCP, OPP and PCB in all samples were below the laboratory practical quantitation limit (PQL)). Detected concentrations of metals, PAH, TRH and PFAS were noted above the laboratory PQL., with exceedances of the adopted ecological SAC are noted as follows:

- B(a)P in five samples (BH3/0.1-0.2, BH8/0.4-0.5, BH14/0.4-0.5, BH15/0.3-0.5, and BH19/0.4-0.5) ranging from 1.5 to 22 mg/kg which exceeds the adopted ecological criterion of 1.4 mg/kg. Results at BH8/0.4-0.5 (22mg/kg) and BH14/0.4-0.5 (7.8 mg/kg) exceeded the criteria by more than two and a half times, thus, representing a hotspot at those locations.

As stated above, five samples reported concentration of B(a)P that exceeded the adopted Tier 1 ESL of 1.4 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 172 mg/kg (or ranging from 57 mg/kg to 371 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 ecosystems and therefore the exceedances are not considered to be of concern.

Given the proposed development it is likely that there will be shallow excavations required for site preparation, levelling and foundations. Given the depth of the B(a)P exceedance ranged from 0.1 to 0.5 m bgl, impacted soil may be removed during construction, which may further reduce the significance of the ecological exceedances.

Therefore, the identified exceedances of the Tier 1 ecological criteria are not considered significant.

12.2 Preliminary waste classification

The following Table 5 presents the results of the six-step procedure outlined in NSW EPA (2014) for determining the type of waste and the waste classification. This process applies to the fill (including surface soils) at the site, which do not meet the definition of VENM.

Table 5: Six step classification procedure

Step	Comments	Rationale
1. Is the waste special waste?	No	No asbestos-containing materials (ACM), clinical or related waste, or waste tyres were observed in the test pits; and Asbestos was not detected by the analytical laboratory.
2. Is the waste liquid waste?	No	The fill comprised a soil matrix.
3. Is the waste "pre-classified"?	No	The fill is not pre-classified with reference to NSW EPA (2014). The natural soil, if classified as VENM, is pre-classified as general solid waste (non-putrescible).
4. Does the waste possess 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. Determining a wastes classification using chemical assessment	Conducted	Refer to Table G2 (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, forestry and crop materials, and natural fibrous organic and vegetative materials (NSW EPA, 2014).

The field and laboratory QA / QC results (Appendix J) for the samples have been reviewed and are considered to be acceptable. The laboratory certificates are included in Appendix I.

As shown in Table G2, Appendix G, all contaminant concentrations for the analysed fill samples were below the contaminant thresholds (CT1s) for Waste Classification, except for the following:

- nickel in nine samples ranging from 50 to 120 mg/kg which exceeds the CT1 criterion of 40 mg/kg, but was within the specific contamination criteria (SSC) SCC1 criterion of 1,050 mg/kg;
- B(a)P in five samples ranging from 0.85 to 7.8 mg/kg which exceeds the CT1 criterion of 0.8 mg/kg, but was within the SCC1 criterion of 10 mg/kg. One sample of B(a)P (BH8/0.4-0.5 at 22mg/kg) exceeded both the CT1 and SCC1 criteria; and
- B(a)P TEQ in sample BH8/0.4-0.5 at 210 mg/kg which exceed the CT1 and SCC1 criteria of 200 mg/kg, but was below the CT2 and SCC2 criteria of 800 mg/kg.

TCLP tests were conducted for the analytes exceeding the CT1 thresholds on representative "worst case" samples. The SCC and TCLP concentrations for those samples were below the contaminant thresholds SCC1 and TCLP1 for general solid waste, except for B(a)P and B(a)P TEQ in sample BH8/0.4-0.5, which were below the SCC2 and TCLP2 thresholds for restricted solid waste.

Correlation analysis of the PAH results (where B(a)P was detected above the laboratory PQL) against known reference data for likely sources of PAH contamination was undertaken using the method outlined by Phillip & McKay (2006), and is provided for reference in Appendix G. The correlation analysis indicated reasonable to very good fits for PAH corresponding to ash from coal / coke sources for most samples, and limited reasonable correlations to other sources (e.g., tar, or diesel sources). It is therefore considered possible the PAH concentrations are attributed to ash sources which are typically immobile in nature.

The NSW EPA general immobilisation order 1995/05 allows for the assessment of waste products (e.g., ash) resulting from combustion of carbonaceous materials such as coal to be undertaken using the respective TCLP concentrations alone. However, the use of this immobilisation order would require additional visual inspection of soils and / or testing using more suitable means of visually inspecting the soils in-situ to confirm the presence of ash.

Based on the outcomes presented in Table 5 and the analytical results, the following preliminary waste classification is provided:

- the area surrounding BH8/0.4-0.5 is preliminarily classified as restricted solid waste (non-putrescible); and
- the remainder of the site is preliminary classified as general solid waste (non-putrescible).

It is noted that this preliminary classification is indicative only and is not to be used for waste disposal. Further work is required before a formal classification suitable for waste disposal can be provided.

12.3 Preliminary VENM classification

The following Table 6 presents the results of the preliminary assessment of natural soil and rock at the site with reference to the VENM definition in the Protection of the Environmental Operations (POEO) Act and the EPA[1] website.

Table 6: VENM classification procedure

Item	Comments	Rationale
1. Is the material natural?	Yes	Natural soil logged in the boreholes as described in Section 11.1. These materials underlie the fill at the site.

[1] https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/virgin-excavated-natural-material

Item	Comments	Rationale
2. Are manufactured chemicals or process residues present?	No	There were no visual or olfactory indicators of chemical contamination of the materials in the boreholes. Concentrations of contaminants were considered to be generally typical of background concentrations (Table G2, Appendix G).
3. Are sulfidic ores or soils present?	No	Refer to Section 5.
4. Are there current or previous land uses that have (or may have) contaminated the materials?	No	Previous land uses may have impacted on surface soils overlying the materials. Low chemical concentrations indicate no likely impact on the natural materials.

As shown in Table G2 provided in Appendix G, all contaminant concentrations for the analysed natural soil samples were within the typical background concentrations with the exception of the following:

- total PAH in BH5/1-1.1 (6.5 mg/kg) which exceeded the ANZECC (1992) background concentration range of 0.95 to 5 mg/kg. It is noted that this sample was collected at the fill / natural interface which could indicate some cross contamination within this layer, rather than the natural clay layer being contaminated.

Classification of natural soils / rock as VENM will require further visual inspection / testing following removal of all overburden, and the above assessment is provided only for preliminary planning purposes.

13. Revised conceptual site model

The data collected for this DSI has generally confirmed that certain potential contaminant sources outlined in the CSM outlined in Section 8 pose a potentially complete pathway to the identified receptor(s) whilst others do not. No other sources of contamination have been identified as a result of the testing results. The following is also noted:

- given the concentrations of metals and pesticides (OCPs and OPPs) were generally low and below the adopted criteria, it is considered that there is a low risk of impact to the site from historical use of pesticides;
- whilst no asbestos was observed during the investigation of detected by laboratory analysis, sampling using boreholes was undertaken which is not the preferred method for investigating asbestos or asbestos-containing material (ACM). Therefore, ACM could still be present in the fill between sampling points;
- based on the soil results and the generally low concentrations of contaminants noted in the natural samples, the contamination reported at the site is not considered to be migrating vertically into the groundwater. TCLP testing also indicated that the contaminants in the fill present a low leaching potential. Therefore, it is considered that the source-pathway-receptor link between the fill and groundwater (via leaching of contaminants and vertical

migration) is not significant at the site. Therefore, no future groundwater assessment is currently considered necessary for the purposes of contamination assessment; and

- no distinct areas of fill attributed to Source S3 (Section 8) were identified and therefore this source has been combined with Source S1 as a more general risk of uncontrolled fill present beneath the site.

Table 7: Updated summary of potentially complete exposure pathways (proposed land use)

Source and CoPC	Exposure pathway	Receptor	Risk management action
S1: Fill: Primary CoPC: benzo(a)pyrene, Secondary CoPC: metals, TRH and asbestos	**HP1:** Ingestion and dermal contact **HP2:** Inhalation of dust and/or vapours	**HR1:** Current users [carparking] **HR2:** Construction and maintenance workers **HR3:** End users [tertiary education]	Formal waste classification (in-situ using test pits, or ex-situ) of surplus soils following removal of the asphalt. Preparation and implementation of an unexpected finds protocol (UFP) for management of potential asbestos and other contaminants
	EP1: Surface water run-off **EP3:** Lateral migration of groundwater providing base flow to water bodies	**ER1:** Surface water [Vineyard Creek]	
	EP4: Inhalation, ingestion and absorption	**ER3:** Terrestrial ecosystems	

14. Conclusions and recommendations

This DSI comprised a review of a relevant previous report, a site walkover, and an intrusive soil sampling investigation to assess the suitability of the site for the proposed developments and whether further investigation / management is necessary.

Based on the observations at the time of the investigation and the analytical results reported herein, the following is summarised:

- all of the chemical contaminant concentrations were within the adopted human health SAC, with exceedances of ecological based SAC for benzo(a)pyrene not considered to be significant based on consideration of higher reliability screening levels and the nature of the proposed development;
- no asbestos was observed during the investigation or detected by laboratory analysis. It is however noted that sampling utilised boreholes through existing hardstand (generally smaller diameter augered boreholes) which is not the preferred method for the assessment of asbestos in soil. Therefore, there is a risk that unidentified asbestos may be present in the fill between sampling points and in untested parts of the site;

- the fill within the site is preliminarily classified as general solid waste (non-putrescible), except for the area surrounding BH8/0.4-0.5, which is preliminarily classified as restricted solid waste (non-putrescible). Further assessment of the soils for the presence of ash (or other related wastes, e.g., charcoal) to review the suitability of assessing the detected PAH concentrations under a NSW EPA immobilisation order; and
- the natural soil (which underlies the fill) does not appear to have been significantly impacted by chemical residues / processes. However, further inspection / testing following removal of overburden will be required to classify the materials as VENM.

It is noted that sampling of groundwater has not been undertaken for the site, however, given that contamination at the site is not considered to be migrating vertically, future groundwater assessment is not considered necessary to assess the site suitability for the proposed development.

Based on the results of the DSI it is considered that the site is suitable for the proposed university development subject to implementation of the following recommendations:

- undertaking a formal waste classification either ex-situ (preferred), or alternatively and if limited by spatial / time constraints, *in-situ* (using test pits) following the removal of the overlying asphalt for any surplus soils; and
- preparation and implementation of a UFP which outlines appropriate response procedures to be undertaken by the development contractor in the event suspected contamination (e.g., asbestos) is encountered during the redevelopment of the site.

If there are changes to the proposed development (e.g., a change in basement levels or site usage), then implementation of the following additional recommendations may be required:

Updating of the DSI for the updated proposed development, taking into account any changes in proposed land use, proposed design (i.e., basement levels), and proposed excavations for the construction of the building or results of subsequent waste classification testing.

15. References

ANZECC. (1992). *Australian and New Zealand Guidelines for the Assessment and Management of Contamianted Sites*.

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.

JKE. (2023). *Preliminary Site Investigation, Contamination-Related Due Diligence*. Ref: E36170PrptRev1, dated 13 September 2023.

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

NSW EPA. (2022). *Contaminated Sites, Sampling Design Guidelines*. NSW Environment Protection Authority.

Phillip, & McKay. (2006). Source characterization and identification as a means of assessing the type of bonding in the soil and its subsequent impact on bioavailability. *Proceedings of the International Symposium and Exhibition on the Redevelopment of Manufactures Gas Plant Sites 14 (2)* (pp. 412-425). Reading, UK: Land Contamination & Reclamation.

16. **Limitations**

Douglas Partners Pty Ltd (Douglas) has prepared this report (or services) for this project at 171 Victora Road, Parramatta NSW in accordance with Douglas' proposal dated 28 February 2024 and acceptance received from Steven Botterill. The work was carried out under the Minor Consultancy Agreement between Douglas and Western Sydney University (CS0353374). This report is provided for the exclusive use of Western Sydney University 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 Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas 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 Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas 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.

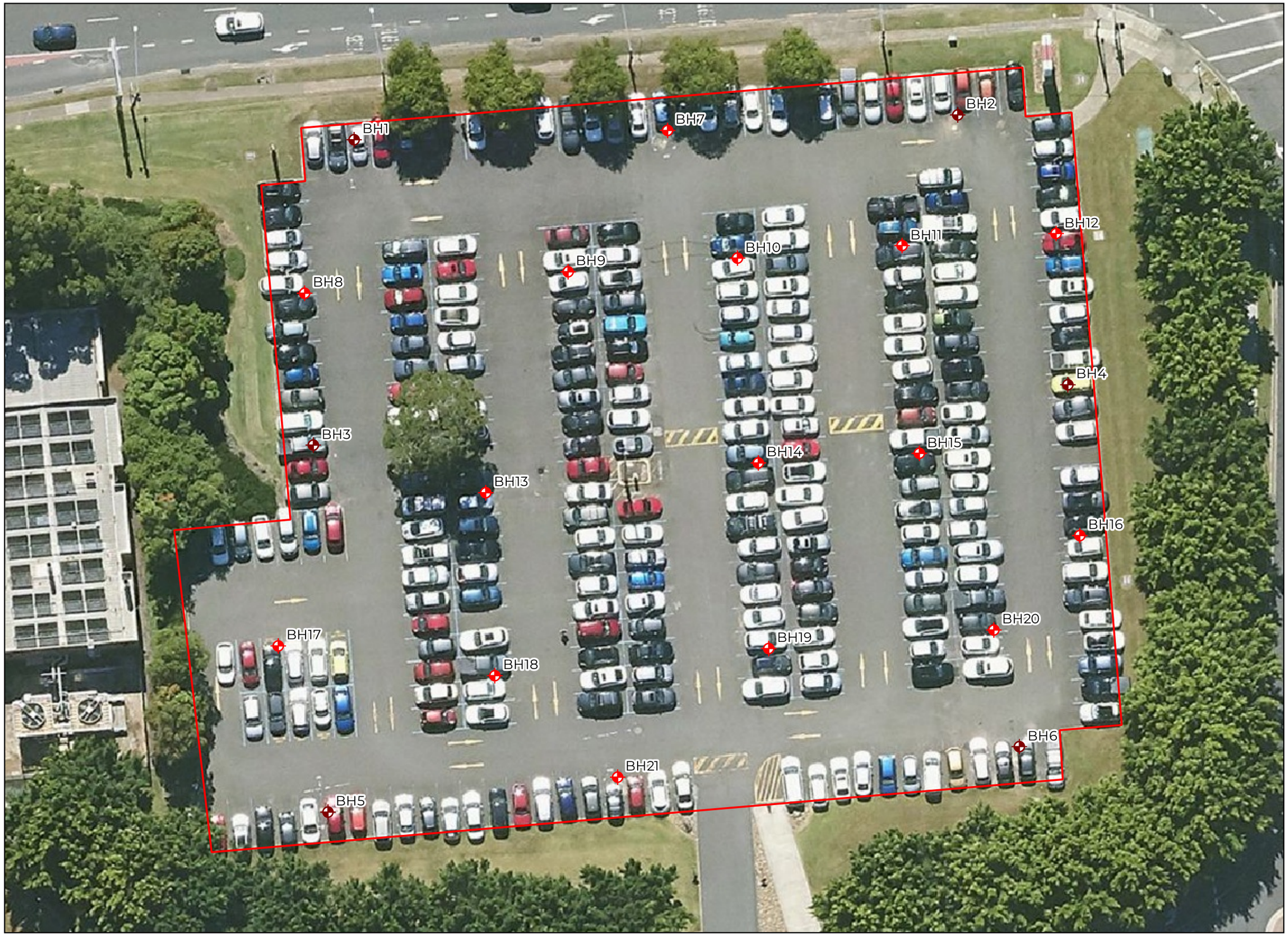
The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed ‘safety in design’ 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. Douglas 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 Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

Appendix A

Drawings



SITE LOCATION

LEGEND

Site Boundary

Boreholes

Geotechnical Boreholes

Environmental Boreholes

0 10 20 m

NOTE:
1. Drawing projection in GDA2020 / MGA zone 56, adapted from aerial imagery from "metromap" dated April 2024.
2. Test locations are approximate only and were located using differential GPS typically accurate to ± 0.1 m depending on satellite coverage

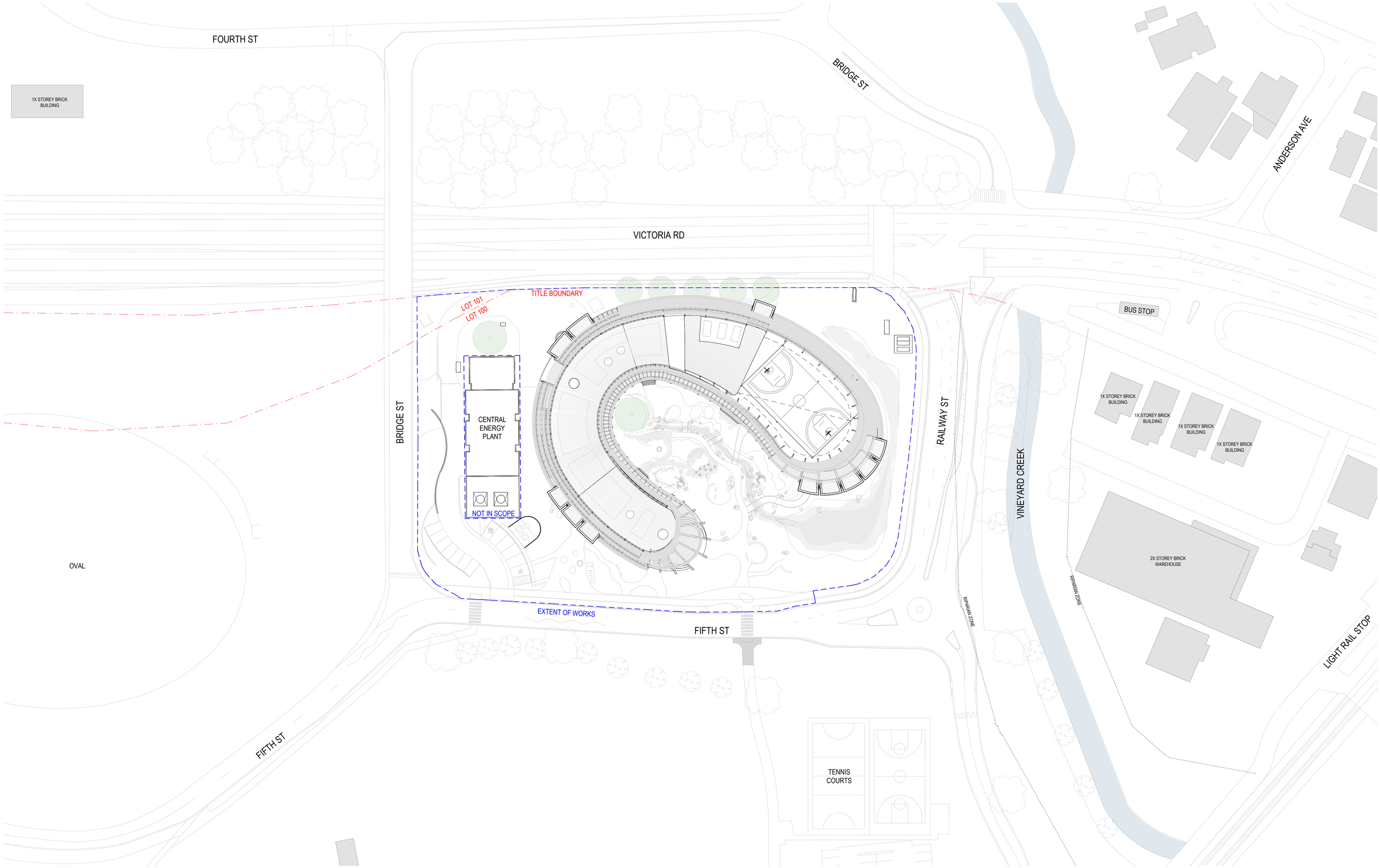
Douglas PARTNERS

CLIENT: Western Sydney University	
OFFICE: Sydney	DRAWN BY: JBC
SCALE: 1:400 @A3	DATE: 14.April.2024

TITLE: **Site Boundary and Test Location Plan**
Indigenous Centre of Excellence
171 Victoria Road, Rydalmere NSW

N

PROJECT:	227190.01
DRAWING No:	1
REVISION:	0



GENERAL NOTES

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USE FIGURED DIMENSIONS ONLY. CHECK AND VERIFY ALL DIMENSIONS ON SITE PRIOR TO COMMENCING WORK.

REV	DATE	DESCRIPTION
1	July 2024	SSDA SUBMISSION
2	February 2025	SSDA SUBMISSION

CLIENT
WESTERN SYDNEY UNIVERSITY

PROJECT
INDIGENOUS CENTRE OF EXCELLENCE
DARUG NGURRA
171 VICTORIA RD,
RYDALMERE NSW 2116

DRAWING TITLE
SITE PLAN - PROPOSED

CHECKED **SW**
APPROVED **TS**

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PROJECT # **23-032**

DRAWING NUMBER
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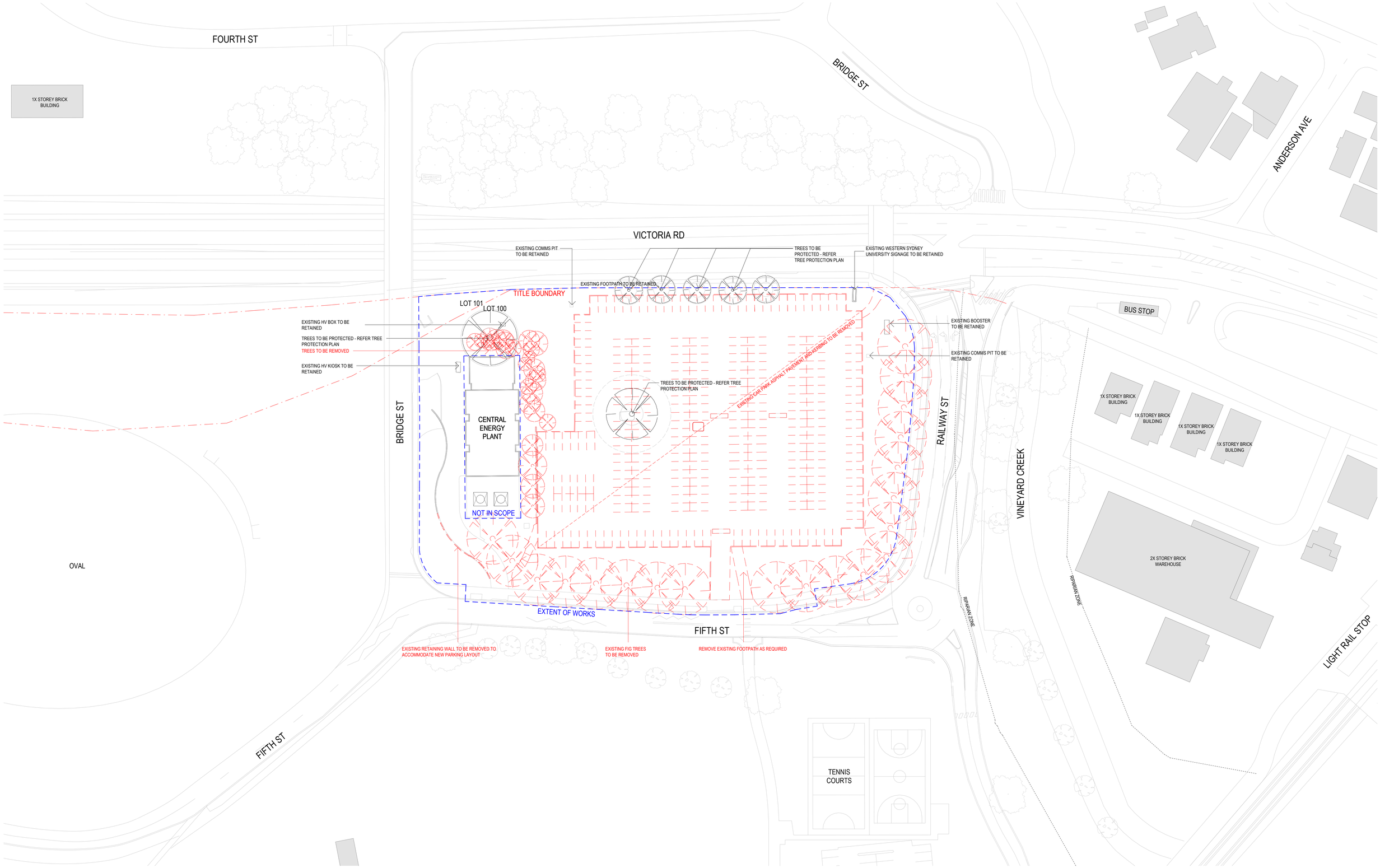
REVISION **2**

Jackson
Clements
Burrows
Architects

psa



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REV	DATE	DESCRIPTION
1	July 2024	SSDA SUBMISSION
2	February 2025	SSDA SUBMISSION

CLIENT
WESTERN SYDNEY UNIVERSITY

PROJECT
INDIGENOUS CENTRE OF EXCELLENCE
DARUG NGURRA
171 VICTORIA RD,
RYDALMERE NSW 2116

DRAWING TITLE
EXISTING CONDITIONS AND DEMOLITION PLAN

CHECKED **SW**
APPROVED **TS**

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STATUS **SSDA**
PROJECT # **23-032**

DRAWING NUMBER **DA 0-103**
REVISION **2**

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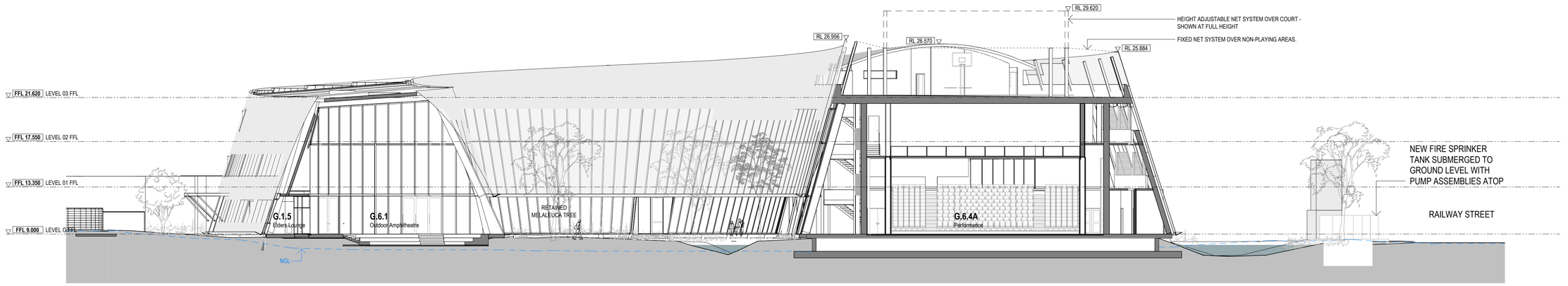

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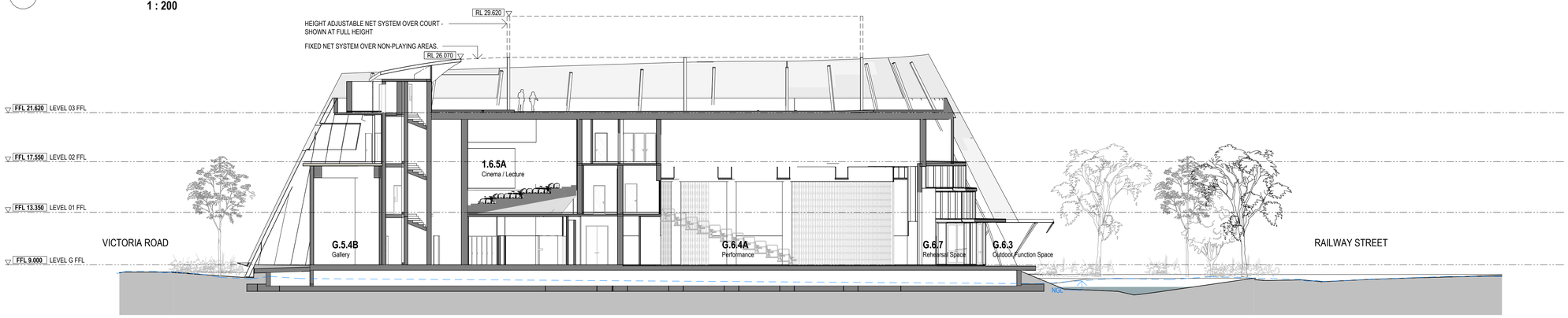

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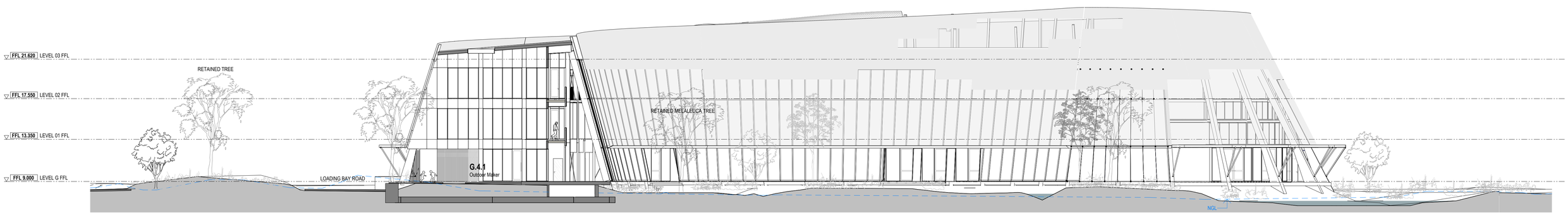

3 **DA SECTION 3**

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REV	DATE	DESCRIPTION
1	July 2024	SSDA SUBMISSION
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PROJECT
INDIGENOUS CENTRE OF EXCELLENCE
DARUG NGURRA
171 VICTORIA RD,
RYDALMERE NSW 2116

DRAWING TITLE
SECTIONS

CHECKED **SW**
APPROVED **TS**

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STATUS
SSDA

PROJECT #
23-032

DRAWING NUMBER
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REVISION
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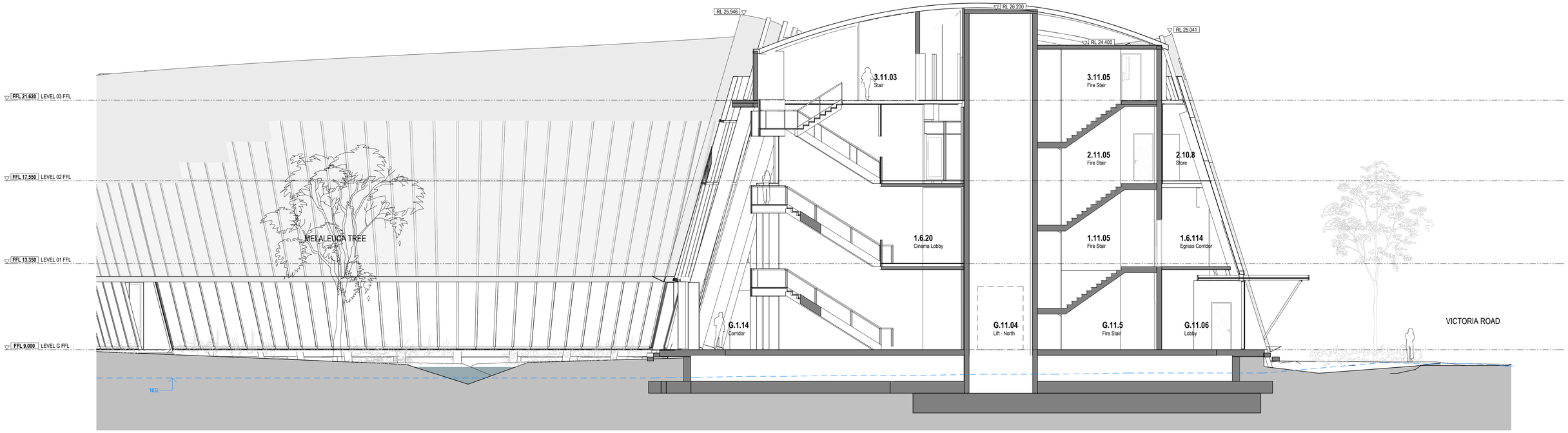

1 **DA SECTION 4**

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REV	DATE	DESCRIPTION
1	July 2024	SSDA SUBMISSION
2	February 2025	SSDA SUBMISSION

CLIENT
WESTERN SYDNEY UNIVERSITY

PROJECT
INDIGENOUS CENTRE OF EXCELLENCE
DARUG NGURRA
171 VICTORIA RD,
RYDALMERE NSW 2116

DRAWING TITLE
SECTIONS

CHECKED **SW**
APPROVED **TS**

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STATUS **SSDA**
PROJECT # **23-032**

DRAWING NUMBER **DA 3-102**
REVISION **2**

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Appendix B

About this Report

About this Report

November 2023

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.

continued next page

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.

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Appendix C

Site Photographs

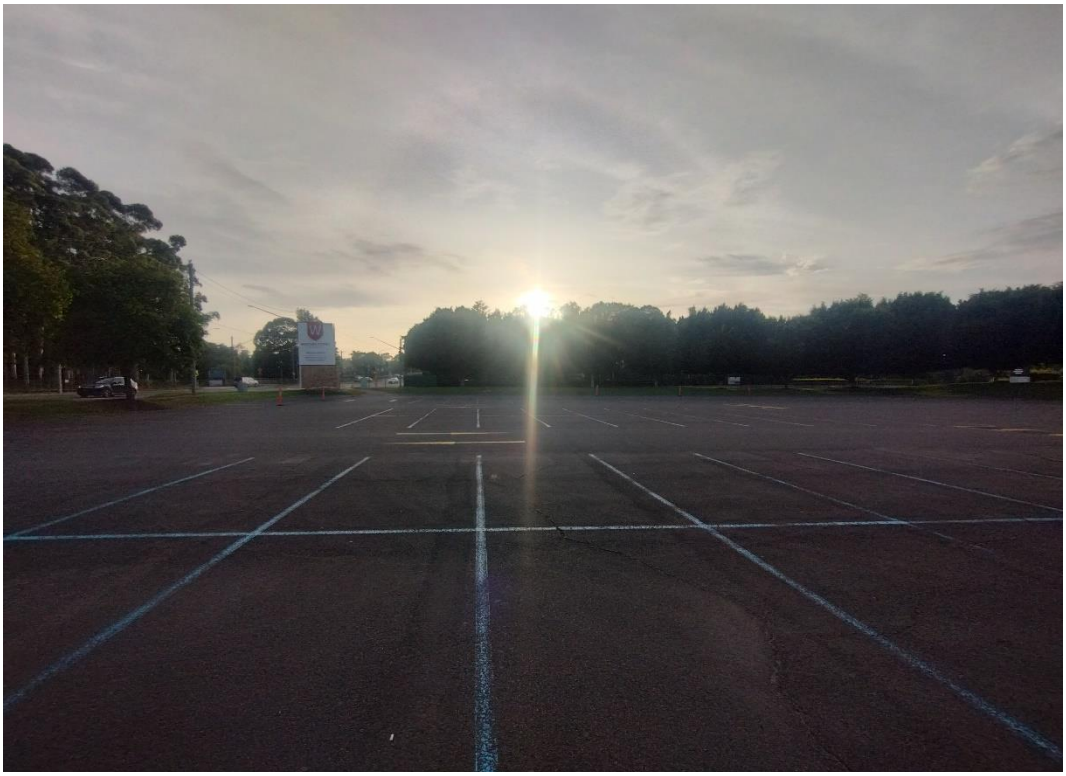

Photo 1: General photograph of site

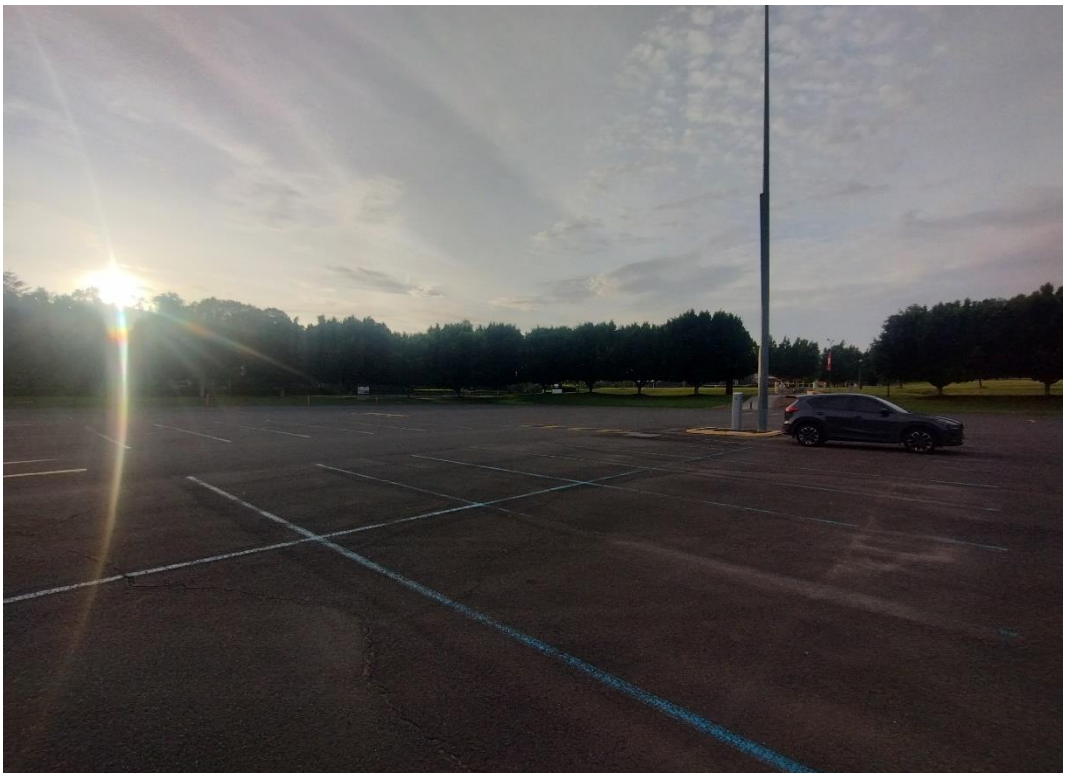

Photo 2: General photograph of site

Douglas PARTNERS	**Site Photographs**	PROJECT:	227190.01
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	CLIENT	Western Sydney University	

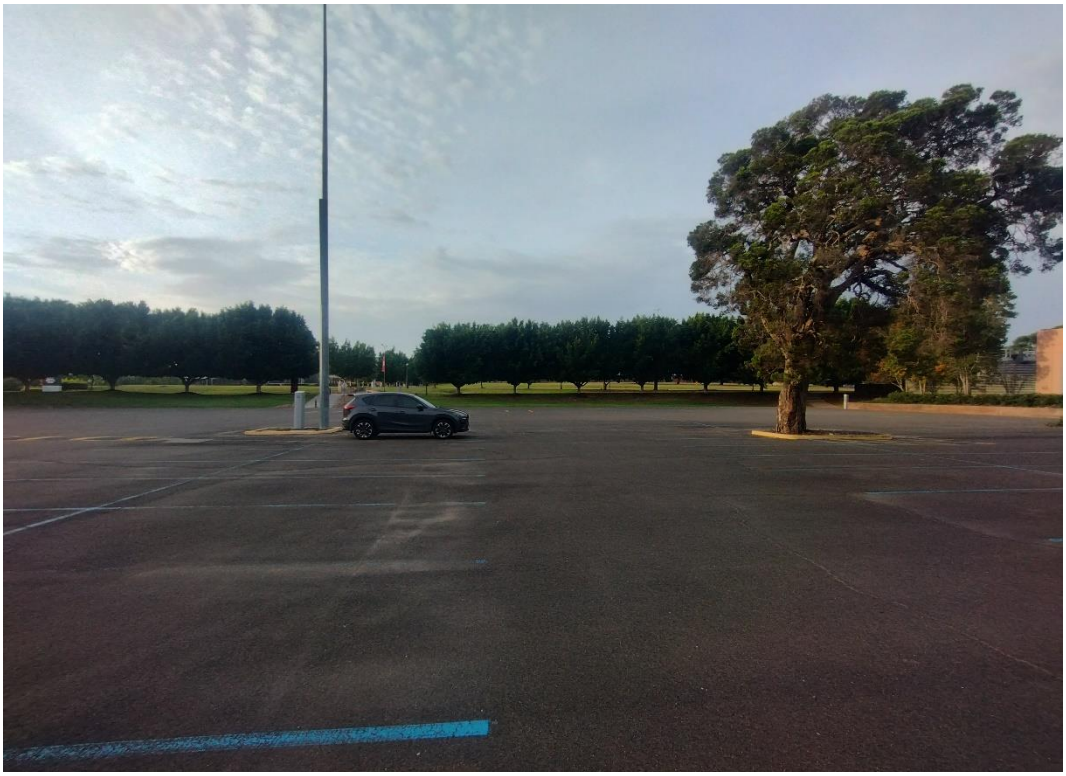

Photo 3: General photograph of site

Photo 4: General photograph of site

Douglas PARTNERS	**Site Photographs**	PROJECT:	227190.01
	ICoE	PLATE No:	2
	171 Victoria Road, Rydamere NSW	REV:	0
	CLIENT	Western Sydney University	

Photo 5: Photograph of grass bank

Photo 6: Photograph of short brick retaining wall and cogeneration plant

Douglas PARTNERS	**Site Photographs**	PROJECT:	227190.01
	ICoE	PLATE No:	3
	171 Victoria Road, Rydamere NSW	REV:	0
	CLIENT	Western Sydney University	

Photo 7: Photograph of cogeneration plant

Photo 8: Photograph of cogeneration plant

Douglas PARTNERS	**Site Photographs**	PROJECT:	227190.01
	ICoE	PLATE No:	4
	171 Victoria Road, Rydamere NSW	REV:	0
	CLIENT	Western Sydney University	

Appendix D

Data Quality Objectives

1. Data quality objectives

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

Table 1: Data quality objectives

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. The requirements of the regulator, Parramatta City Council, will also be considered by consulting their Development Control Plan (DCP), Local Environment Plan (LEP) and any other requirements based on our recent experience with Council on similar sites. A preliminary conceptual site model (CSM) has been prepared (Section 8) for the proposed development. The project team consisted of experienced environmental engineers and scientists working in the roles of Project Principal, Project Reviewer, Project Manager and 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 will be derived and a decision made on whether (or not) further assessment and / or remediation will be required.
3: Identify the information inputs	Inputs to the investigation will be the results of analysis of samples to measure the concentrations of CoPC identified in the CSM (Section 8) at the site using National Association of Testing Authorities (NATA) accredited laboratories and methods, where possible. The SAC for each of the CoPC are detailed in Appendix F. A photoionisation detector (PID) was used on-site to screen soils for volatile organic compounds (VOC). PID readings will be used to inform sample selection for laboratory analysis.
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. Constraints to the assessment are identified and discussed in the conclusions of the report, Section 14.

Step	Summary
5: Develop the analytical approach (or decision rule)	The decision rule is to compare all analytical results with the 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 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, 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 and / or statistical analysis of data (in line with NEPC (2013)) exceed human health and environmental SAC and pose a potentially unacceptable risk to receptors (null hypothesis). Alternative condition: Contaminants at the site and statistical analysis of data (in line with NEPC (2013)) 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. Uncertainty that may exist due to the above potential decision errors shall be mitigated as follows: • As well as a primary screening exercise, the use of the 95% UCL as per NEPC (2013) may be applied, i.e.: 95% is the defined confidence level associated with the UCL on the geometric mean for contaminant data. The resultant 95% UCL shall subsequently be screened against the corresponding SAC. The statistical assessment will only be able to be applied to certain data-sets, such as those obtained via systematic sampling. Identification of areas for targeted sampling will be via professional judgement and errors will not be able to have a probability assigned to them.
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.

2. 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.

Appendix E

Field Work Methodology

1. Guidelines

The following key guidelines were consulted for the field work methodology:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).
- HEPA *PFAS National Environmental Management Plan (NEMP)* (HEPA, 2020).

2. Soil sampling

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

- collect soil samples directly from solid flight auger at nominated depths;
- place samples into laboratory-prepared glass jars with Teflon lined lids, capping immediately and minimising headspace within the sample jar;
- place samples into laboratory-prepared containers (specific for PFAS), capping immediately and minimising headspace within the sample jar;
- collect replicate samples in zip-lock bags for photoionisation detector (PID) screening;
- collect ~500 ml samples in zip-lock bags for fibrous asbestos and asbestos fines (FA and AF) analysis;
- wear a new disposable nitrile glove for each sample point thereby minimising potential for cross-contamination;
- collect 10% replicate samples for quality control (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; and
- use chain of custody documentation.

Reference was made to HEPA (2020) for requirements specific to PFAS.

2.1 Field testing

Field testing is carried out in accordance with Douglas' standard operating procedures. The general sampling and sample management procedures comprise:

PID Field Test

- calibrate the PID with isobutylene gas at 100 ppm and with fresh air prior to commencement of each successive day's field work;
- allow the headspace in the PID zip-lock bag samples to equilibrate; and
- screen using the PID.

3. References

HEPA. (2020). *PFAS National Environmental Management Plan (NEMP).* Version 2.0: Heads of EPAs Australia and New Zealand and Australian Government Department 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.

Appendix F

Site Assessment Criteria

1. Introduction

1.1 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) [the 'NEPM']* (NEPC, 2013).
- CRC CARE *Health screening levels for petroleum hydrocarbons in soil and groundwater* (CRC CARE, 2011).
- HEPA *PFAS National Environmental Management Plan (NEMP)* (HEPA, 2020).

1.2 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: University building.
    - corresponding to land use category 'D', commercial / industrial such as shops, offices, factories and industrial sites.
- soil type: clay.

It is noted that while the proposed development comprises the construction of a building for a university, the adoption of a generic commercial / industrial land use scenario is considered most appropriate to represent the land use based on the following:

- the proposed development would be used in a university context where staff (e.g., teachers, maintenance staff) would likely have a potential longer exposure scenario (e.g., up to the 30 years over the course of a working career, as per assumptions for workers set out in NEPC (2013)), as compared to students who will likely only be exposure for a shorter duration (reasonably less than 10 to15 years for typical tertiary degree lengths). Exposure frequency of the staff would be that of a typical worker (i.e., eight hours per day, 240 days per year); and
- the proposed development is anticipated to occupy most of the site, thus, limiting the site users' access to open landscape on the site. The recommended NEPC (2013) land use category for secondary schools (most similar to tertiary education) comprises a recreational land-use scenario, which therefore would not be representative;
- other land-use scenarios e.g., high-density residential B, which can constitute a scenario for limited access to soils, assumes people living at the site and therefore is not representative of the site usage; and
- given the university context, the general population of users would be adults and although children would be welcome on an intermittent basis (i.e., special events), it is unlikely that children would visit frequently.

2. Soils

2.1 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 HIL and HSL for the contaminants of concern are presented in Table 1 and Table 2.

Table 1: Health investigation levels (mg/kg)

Contaminant	HIL-D
Metals	
Arsenic	3000
Cadmium	900
Chromium (VI)	3600
Copper	240 000
Lead	1500
Mercury (inorganic)	730
Nickel	6000
Zinc	400 000
PAH	
B(a)P TEQ	40
Total PAH	4000
Phenols	
Phenol	240 000
OCP	
DDT+DDE+DDD	3600
Aldrin and dieldrin	45
Chlordane	530
Endosulfan	2000
Endrin	100
Heptachlor	50
HCB	80
Methoxychlor	2500
Mirex	100

Contaminant	HIL-D
OPP	
Chlorpyrifos	2000
PCB	
PCB	7

Table 2: Health screening levels (mg/kg)

Contaminant	HSL-D	HSL-D	HSL-D	HSL-D
CLAY	**0 m to <1 m**	**1 m to <2 m**	**2 m to <4 m**	**4 m+**
Benzene	4	6	9	20
Toluene	NL	NL	NL	NL
Ethylbenzene	NL	NL	NL	NL
Xylenes	NL	NL	NL	NL
Naphthalene	NL	NL	NL	NL
TRH F1	310	480	NL	NL
TRH F2	NL	NL	NL	NL

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 presented in Table 3.

Table 3: Health screening levels for direct contact (mg/kg)

Contaminant	DC HSL-D
Benzene	430
Toluene	99 000
Ethylbenzene	27 000
Xylenes	81 000
Naphthalene	11 000
TRH F1	26 000
TRH F2	20 000
TRH F3	27 000
TRH F4	38 000

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

2.2 Health investigation levels for per- and poly-fluoroalkyl substances in soil

The laboratory analytical results for per- and poly-fluoroalkyl substances (PFAS) in soil have been assessed against HIL published in HEPA (2020). The HIL represent a nationally-agreed suite that should be used to inform site investigations. The HIL are intentionally conservative, and an exceedance of these criteria may not constitute a risk if other exposure pathways are controlled. An exceedance of the HIL should trigger further investigations, such as a site-specific risk assessment. At the time of this investigation, screening values were available only for perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA) and perfluorohexane sulfonate (PFHxS).

The HIL derived from Table 2 of HEPA (2020) are presented in Table 4.

Table 4: Health investigation levels (mg/kg)

Contaminant	HIL-D
PFOS and PFHxS *	20
PFOA	50

Notes: * Includes PFOS only, PFHxS only and the sum of the two.

2.3 Asbestos in soil

The HSL for asbestos in soil are based on likely exposure levels for different scenarios published in NEPC (2013) for the following forms of asbestos:

- bonded asbestos containing material (ACM); and
- fibrous asbestos and asbestos fines (FA and AF).

The HSL are in Table 5.

Table 5: Health screening levels for asbestos

Form of asbestos	HSL-A	HSL-B	HSL-C	HSL-D
ACM	0.01%	0.04%	0.02%	0.05%
FA and AF	0.001%	0.001%	0.001%	0.001%
FA and AF and ACM	No visible asbestos for surface soil *	No visible asbestos for surface soil *	No visible asbestos for surface soil *	No visible asbestos for surface soil *

Notes: Surface soils defined as top 10 cm.
* Based on site observations at the sampling points and the analytical results of surface samples.

2.4 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 presented in Table 7, with inputs into their derivation are presented in Table 6.

Table 6: Inputs to the derivation of the ecological investigation levels

Variable	Input	Rationale
Age of contaminants	"Aged" (>2 years)	Assumed
pH	8.52	Average of laboratory results.
CEC	28.58 $cmol_c/kg$	Average of laboratory results.
Clay content	70%	Assumed average based on different soils encountered.
Traffic volumes	High	Site locality.
State / Territory	NSW	Site locality.

Table 7: Ecological investigation levels (mg/kg)

Contaminant	EIL-D
Metals	
Arsenic	160
Copper	340
Nickel	580
Chromium III	1400
Lead	1800
Zinc	1600
PAH	
Naphthalene	370
OCP	
DDT	640

2.5 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 presented in Table 8.

Table 8: Ecological screening levels (mg/kg)

Contaminant	Soil Type	ESL-D
Benzene	Fine	95
Toluene	Fine	135
Ethylbenzene	Fine	185
Xylenes	Fine	95
TRH F1	Coarse/ Fine	215*

Contaminant	Soil Type	ESL-D
TRH F2	Coarse/ Fine	170*
TRH F3	Fine	2500
TRH F4	Fine	6600
B(a)P	Fine	1.4

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

2.6 Ecological soil guideline values

The interim ecological soil guideline values (EGV) derived from Table 3 of HEPA (2020) are presented in Table 9.

Table 9: Ecological soil guideline values (mg/kg) – all land uses

Contaminant	Direct exposure	Indirect exposure
PFOS	1	0.01
PFOA	10	NC
PFHxS	NC	NC

Notes: NC no criterion

2.7 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; and
- effects on buried infrastructure e.g., penetration of, or damage to, in-ground services.

The adopted management limits are presented in Table 10.

Table 10: Management limits (mg/kg)

Contaminant	Soil type	ML-D
TRH F1	Coarse	700
TRH F2	Coarse	1000
TRH F3	Coarse	3500
TRH F4	Coarse	10 000

Notes: TRH F1 is TRH C_6-C_{10} including BTEX
TRH F2 is TRH >C_{10}-C_{16} including naphthalene
ML-A-B-C residential, parkland and public open space

3. 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.

HEPA. (2020). *PFAS National Environmental Management Plan (NEMP).* Version 2.0: Heads of EPAs Australia and New Zealand and Australian Government Department 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.

Appendix G

Summary Results Tables

Douglas PARTNERS

Table G1: Summary of Laboratory Results – Soils

			Metals								PAH				TRH					
			Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (B(a)P)	Benzo(a)pyrene TEQ (B(a)P TEQ)	Total PAH	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)
		PQL	4	0.4	1	1	1	0.1	1	1	1	0.05	0.5	0.05	25	50	25	50	100	100
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
BH1	0.1 - 0.2 m	01/03/24	<4	<0.4	**14**	**60**	**9**	<0.1	**30**	**35**	<1	<0.05	<0.5	**0.2**	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH1	1 - 1.1 m	01/03/24	**5**	<0.4	**16**	**13**	**17**	<0.1	**11**	**31**	<1	<0.05	<0.5	**0.2**	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	480 215	NL -	- 2,500	- 6,600
BH2	0.1 - 0.2 m	09/03/24	<4	<0.4	**15**	**62**	**3**	<0.1	**61**	**40**	<1	<0.05	<0.5	**0.3**	<25	<50	<25	<50	<100	**160**
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH2	0.5 - 0.6 m	09/03/24	**4**	<0.4	**18**	**5**	**12**	<0.1	**5**	**9**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BD1/20240309	0 m	09/03/24	**5**	<0.4	**19**	**5**	**13**	<0.1	**4**	**9**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH3	0.1 - 0.2 m	10/03/24	<4	<0.4	**15**	**110**	**3**	<0.1	**7**	**36**	<1	**3.2**	**4.6**	**30**	<25	<50	<25	<50	**600**	**1,600**
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH4	0.1 - 0.2 m	10/03/24	<4	<0.4	**18**	**47**	**16**	<0.1	**32**	**49**	<1	**0.3**	<0.5	**2.6**	<25	<50	<25	<50	**260**	**290**
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH5	0.1 - 0.2 m	10/03/24	<4	<0.4	**24**	**52**	**21**	<0.1	**90**	**49**	<1	**0.1**	<0.5	**1**	<25	<50	<25	<50	**270**	**640**
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH5	1 - 1.1 m	10/03/24	<4	<0.4	**9**	**4**	**27**	<0.1	**4**	**16**	<1	**0.73**	**0.9**	**6.5**	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	480 215	NL -	- 2,500	- 6,600
BH6	0.5 - 0.6 m	09/03/24	<4	<0.4	**14**	**61**	**1**	<0.1	**88**	**44**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH6	1.5 - 1.6 m	09/03/24	<4	<0.4	**10**	**31**	<1	<0.1	**54**	**25**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	480 215	NL -	- 2,500	- 6,600
BH7	0.1 - 0.2 m	24/03/24	<4	<0.4	**16**	**72**	<1	<0.1	**92**	**34**	<1	**0.06**	<0.5	**0.3**	<25	<50	<25	<50	**130**	**240**
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH7	0.9 - 1 m	24/03/24	**5**	<0.4	**19**	**11**	**21**	<0.1	**6**	**7**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH8	0.3 - 0.4 m	24/03/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BH8	0.4 - 0.5 m	24/03/24	**5**	<0.4	**13**	**22**	**19**	<0.1	**25**	**23**	<1	**22**	**32**	**210**	<25	**66**	<25	**66**	**2,000**	**580**
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH8	1.3 - 1.4 m	24/03/24	**6**	<0.4	**22**	**7**	**19**	<0.1	**8**	**9**	<1	**0.5**	**0.6**	**4.4**	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	480 215	NL -	- 2,500	- 6,600
BD2/20240324 [ALS]	-	24/03/24	**6**	<1	**22**	**6**	**20**	<0.1	**8**	**6**	<0.5	<0.5	<0.5	<0.5	<10	<50	<10	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	480 215	NL -	- 2,500	- 6,600
BH9	0.5 - 0.7 m	24/03/24	**7**	<0.4	**35**	**55**	**30**	**0.3**	**3**	**93**	<1	**0.62**	**0.8**	**4.3**	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH10	0.1 - 0.2 m	24/03/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BH10	0.3 - 0.4 m	24/03/24	<4	<0.4	**15**	**2**	**16**	<0.1	**3**	**4**	<1	**0.09**	<0.5	**0.58**	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH11	0.1 - 0.2 m	24/03/24	<4	<0.4	**21**	**73**	<1	<0.1	**120**	**49**	<1	**0.1**	<0.5	**1.1**	<25	<50	<25	<50	**130**	**380**
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH11	0.8 - 0.9 m	24/03/24	<4	<0.4	**14**	**11**	**16**	<0.1	**6**	**6**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BD3/20240324	0 m	24/03/24	**5**	<0.4	**15**	**11**	**17**	<0.1	**5**	**6**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH12	0.1 - 0.2 m	24/03/24	<4	<0.4	**18**	**62**	**22**	<0.1	**15**	**58**	<1	**0.1**	<0.5	**1.1**	<25	<50	<25	<50	**290**	**510**
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH13	0 - 0.2 m	24/03/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BH13	1 - 1.2 m	24/03/24	**4**	<0.4	**11**	**4**	**17**	<0.1	**2**	**9**	<1	**0.08**	<0.5	**0.51**	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000(340	1,500 1,800	730 -	6,000 580	400,000(1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	480 215	NL -	- 2,500	- 6,600

Douglas PARTNERS

Table G1: Summary of Laboratory Results – Soils

			Metals								PAH				TRH					
			Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene [b]	Benzo(a)pyrene (B(a)P)	Benzo(a)pyrene TEQ (B(a)P TEQ)	Total PAH	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)
		PQL	4	0.4	1	1	1	0.1	1	1	1	0.05	0.5	0.05	25	50	25	50	100	100
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
BH14	0.1 - 0.2 m	24/03/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BH14	0.4 - 0.5 m	24/03/24	<4	<0.4	**15**	**63**	**32**	<0.1	**60**	**50**	<1	**7.8**	**11**	**65**	<25	<50	<25	<50	**860**	**530**
			3,000 160	900 -	3,600 1,400	240,000 340	1,500 1,800	730 -	6,000 580	400,000 1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH15	0.3 - 0.5 m	24/03/24	**6**	<0.4	**17**	**18**	**43**	**0.4**	**5**	**39**	<1	**1.5**	**2.1**	**17**	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000 340	1,500 1,800	730 -	6,000 580	400,000 1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH16	0.5 - 0.6 m	24/03/24	<4	<0.4	**13**	**37**	**24**	**0.4**	**59**	**42**	<1	**0.2**	<0.5	**2**	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000 340	1,500 1,800	730 -	6,000 580	400,000 1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH16	0.7 - 0.8 m	24/03/24	<4	<0.4	**12**	**23**	**44**	<0.1	**9**	**100**	<1	**0.52**	**0.7**	**7.3**	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000 340	1,500 1,800	730 -	6,000 580	400,000 1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH17	0.4 - 0.5 m	24/03/24	<4	<0.4	**18**	**34**	**27**	<0.1	**50**	**44**	<1	**0.06**	<0.5	**0.3**	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000 340	1,500 1,800	730 -	6,000 580	400,000 1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH17	1.8 - 1.9 m	24/03/24	**4**	<0.4	**10**	**12**	**16**	<0.1	**2**	**7**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000 340	1,500 1,800	730 -	6,000 580	400,000 1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	480 215	NL -	- 2,500	- 6,600
BD1/20240324	0 m	24/03/24	**5**	<0.4	**10**	**11**	**16**	<0.1	**2**	**7**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000 340	1,500 1,800	730 -	6,000 580	400,000 1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH18	0.5 - 0.7 m	24/03/24	**4**	<0.4	**16**	**6**	**59**	<0.1	**3**	**39**	<1	**0.85**	**1.1**	**9.1**	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000 340	1,500 1,800	730 -	6,000 580	400,000 1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH19	0.4 - 0.5 m	24/03/24	**8**	<0.4	**15**	**8**	**41**	<0.1	**8**	**41**	<1	**2**	**2.7**	**25**	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000 340	1,500 1,800	730 -	6,000 580	400,000 1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH19	0.9 - 1 m	24/03/24	<4	<0.4	**12**	**3**	**21**	<0.1	**2**	**20**	<1	**0.3**	<0.5	**3.2**	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000 340	1,500 1,800	730 -	6,000 580	400,000 1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH19	1.3 - 1.4 m	24/03/24	<4	<0.4	**8**	**3**	**12**	<0.1	**2**	**7**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000 340	1,500 1,800	730 -	6,000 580	400,000 1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	480 215	NL -	- 2,500	- 6,600
BH20	0.1 - 0.2 m	24/03/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BH20	0.4 - 0.5 m	24/03/24	<4	<0.4	**14**	**9**	**12**	<0.1	**15**	**16**	<1	**0.2**	<0.5	**1.4**	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000 340	1,500 1,800	730 -	6,000 580	400,000 1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH20	0.9 - 1 m	24/03/24	<4	<0.4	**8**	**27**	**82**	<0.1	**23**	**170**	<1	**0.2**	<0.5	**1.9**	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000 340	1,500 1,800	730 -	6,000 580	400,000 1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH21	0.1 - 0.2 m	24/03/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BH21	0.3 - 0.4 m	24/03/24	<4	<0.4	**8**	**4**	**11**	<0.1	**6**	**14**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100
			3,000 160	900 -	3,600 1,400	240,000 340	1,500 1,800	730 -	6,000 580	400,000 1,600	NL 370	- 1.4	40 -	4,000 -	- -	- 170	310 215	NL -	- 2,500	- 6,600
BH8 - [TRIPLICATE]	0.4 - 0.5 m	24/03/24	<4	<0.4	**13**	**14**	**25**	<0.1	**20**	**26**	-	-	-	-	-	-	-	-	-	-
			3,000 160	900 -	3,600 1,400	240,000 340	1,500 1,800	730 -	6,000 580	400,000 1,600	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
BH20 - [TRIPLICATE]	0.4 - 0.5 m	24/03/24	<4	<0.4	**13**	**12**	**19**	<0.1	**20**	**26**	-	-	-	-	-	-	-	-	-	-
			3,000 160	900 -	3,600 1,400	240,000 340	1,500 1,800	730 -	6,000 580	400,000 1,600	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

Lab result

HIL/HSL value EIL/ESL/EGV 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 **Red** = EGV-indirect exceedance HSL 0-<1 Exceedance

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

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

Notes:

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

b Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL

c EIL criteria applies to DDT only

Site Assessment Criteria (SAC):

SAC based on generic land use thresholds for Commercial/ industrial D

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

HIL	HIL-D (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
HSL (vapour ir	HSL-D (NEPC, 2013)	ESL	Commercial and Industrial (NEPC, 2013)
DC	Direct contact HSL D Commercial/Industrial (CRC CARE, 2011)	ML	Commercial and Industrial (NEPC, 2013)
		EGV-Indir	EGV, all land uses, Indirect exposure (HEPA, 2020)

Douglas PARTNERS

Table G1: Summary of Laboratory Re

			BTEX				Phenols	OCP										OPP	PCB	PFAS					Asbestos	
			Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Phenolics	DDT	DDT+DDE+DDD [C]	Aldrin + Dieldrin	Total Chlordane	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Mirex	Chlorpyriphos	Total PCB	Total Positive PFAS	PFOA	PFOS + PFHxS	PFOS	PFHxS	FA and AF Estimation	Asbestos ID in soil >0.1g/kg
		PQL	0.2	0.5	1	1	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	0.0001	0.0001	0.0001	0.0001	0.0001	0.001	
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	%(w/w)	-
BH1	0.1 - 0.2 m	01/03/24	<0.2	<0.5	<1	<1	<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	**0.0002**	<0.0001	**0.0002**	**0.0002**	<0.0001	<0.001	NAD
			4 95	NL 135	NL 185	NL 95	660 -	- 640	3,600 640	45 -	530 -	2,000 -	100 -	50 -	80 -	2,500 -	100 -	2,000 -	7 -	- -	50 10	20 -	20 1	20 -	0.001 -	
BH1	1 - 1.1 m	01/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			6 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BH2	0.1 - 0.2 m	09/03/24	<0.2	<0.5	<1	<1	<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	-	-	-	-	-	-	NAD
			4 95	NL 135	NL 185	NL 95	660 -	- 640	3,600 640	45 -	530 -	2,000 -	100 -	50 -	80 -	2,500 -	100 -	2,000 -	7 -	- -	- -	- -	- -	- -	- -	
BH2	0.5 - 0.6 m	09/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BD1/20240309	0 m	09/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BH3	0.1 - 0.2 m	10/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	NAD
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.001 -	
BH4	0.1 - 0.2 m	10/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0002**	<0.0001	**0.0002**	**0.0002**	<0.0001	<0.001	NAD
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	50 10	20 -	20 1	20 -	0.001 -	
BH5	0.1 - 0.2 m	10/03/24	<0.2	<0.5	<1	<1	<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	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	NAD
			4 95	NL 135	NL 185	NL 95	660 -	- 640	3,600 640	45 -	530 -	2,000 -	100 -	50 -	80 -	2,500 -	100 -	2,000 -	7 -	- -	50 10	20 -	20 1	20 -	0.001 -	
BH5	1 - 1.1 m	10/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			6 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BH6	0.5 - 0.6 m	09/03/24	<0.2	<0.5	<1	<1	<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	-	-	-	-	-	<0.001	NAD
			4 95	NL 135	NL 185	NL 95	660 -	- 640	3,600 640	45 -	530 -	2,000 -	100 -	50 -	80 -	2,500 -	100 -	2,000 -	7 -	- -	- -	- -	- -	- -	0.001 -	
BH6	1.5 - 1.6 m	09/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			6 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BH7	0.1 - 0.2 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BH7	0.9 - 1 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BH8	0.3 - 0.4 m	24/03/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0001**	<0.0001	**0.0001**	**0.0001**	<0.0001	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	50 10	20 -	20 1	20 -	- -	
BH8	0.4 - 0.5 m	24/03/24	<0.2	<0.5	<1	<1	<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	-	-	-	-	-	<0.001	NAD
			4 95	NL 135	NL 185	NL 95	660 -	- 640	3,600 640	45 -	530 -	2,000 -	100 -	50 -	80 -	2,500 -	100 -	2,000 -	7 -	- -	- -	- -	- -	- -	0.001 -	
BH8	1.3 - 1.4 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD
			6 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BD2/20240324 [ALS]	-	24/03/24	<0.2	<0.5	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			6 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BH9	0.5 - 0.7 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BH10	0.1 - 0.2 m	24/03/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	50 10	20 -	20 1	20 -	- -	
BH10	0.3 - 0.4 m	24/03/24	<0.2	<0.5	<1	<1	<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	-	-	-	-	-	<0.001	NAD
			4 95	NL 135	NL 185	NL 95	660 -	- 640	3,600 640	45 -	530 -	2,000 -	100 -	50 -	80 -	2,500 -	100 -	2,000 -	7 -	- -	- -	- -	- -	- -	0.001 -	
BH11	0.1 - 0.2 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BH11	0.8 - 0.9 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BD3/20240324	0 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BH12	0.1 - 0.2 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.0002**	<0.0001	**0.0002**	**0.0002**	<0.0001	-	NAD
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	50 10	20 -	20 1	20 -	- -	
BH13	0 - 0.2 m	24/03/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	50 10	20 -	20 1	20 -	- -	
BH13	1 - 1.2 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD
			6 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	

Douglas PARTNERS

Table G1: Summary of Laboratory Re

			BTEX				Phenols	OCP										OPP	PCB	PFAS					Asbestos	
			Benzene	Toluene	Ethylbenzene	Total Xylenes	Total Phenolics	DDT	DDT+DDE+DDD [c]	Aldrin + Dieldrin	Total Chlordane	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Mirex	Chlorpyriphos	Total PCB	Total Positive PFAS	PFOA	PFOS + PFHxS	PFOS	PFHxS	FA and AF Estimation	Asbestos ID in soil >0.1g/kg
		PQL	0.2	0.5	1	1	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	0.0001	0.0001	0.0001	0.0001	0.0001	0.001	
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	%(w/w)	-
BH14	0.1 - 0.2 m	24/03/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	50 10	20 -	20 1	20 -	- -	
BH14	0.4 - 0.5 m	24/03/24	<0.2	<0.5	<1	<1	<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	-	-	-	-	-	<0.001	NAD
			4 95	NL 135	NL 185	NL 95	660 -	- 640	3,600 640	45 -	530 -	2,000 -	100 -	50 -	80 -	2,500 -	100 -	2,000 -	7 -	- -	- -	- -	- -	- -	0.001 -	
BH15	0.3 - 0.5 m	24/03/24	<0.2	<0.5	<1	<1	<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	**0.0002**	<0.0001	**0.0002**	**0.0002**	<0.0001	<0.001	NAD
			4 95	NL 135	NL 185	NL 95	660 -	- 640	3,600 640	45 -	530 -	2,000 -	100 -	50 -	80 -	2,500 -	100 -	2,000 -	7 -	- -	50 10	20 -	20 1	20 -	0.001 -	
BH16	0.5 - 0.6 m	24/03/24	<0.2	<0.5	<1	<1	<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	-	-	-	-	-	<0.001	NAD
			4 95	NL 135	NL 185	NL 95	660 -	- 640	3,600 640	45 -	530 -	2,000 -	100 -	50 -	80 -	2,500 -	100 -	2,000 -	7 -	- -	- -	- -	- -	- -	0.001 -	
BH16	0.7 - 0.8 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BH17	0.4 - 0.5 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	NAD
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.001 -	
BH17	1.8 - 1.9 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD
			6 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BD1/20240324	0 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BH18	0.5 - 0.7 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BH19	0.4 - 0.5 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.001	NAD
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	0.001 -	
BH19	0.9 - 1 m	24/03/24	<0.2	<0.5	<1	<1	<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	-	-	-	-	-	<0.001	NAD
			4 95	NL 135	NL 185	NL 95	660 -	- 640	3,600 640	45 -	530 -	2,000 -	100 -	50 -	80 -	2,500 -	100 -	2,000 -	7 -	- -	- -	- -	- -	- -	0.001 -	
BH19	1.3 - 1.4 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NAD
			6 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BH20	0.1 - 0.2 m	24/03/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	50 10	20 -	20 1	20 -	- -	
BH20	0.4 - 0.5 m	24/03/24	<0.2	<0.5	<1	<1	<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	-	-	-	-	-	<0.001	NAD
			4 95	NL 135	NL 185	NL 95	660 -	- 640	3,600 640	45 -	530 -	2,000 -	100 -	50 -	80 -	2,500 -	100 -	2,000 -	7 -	- -	- -	- -	- -	- -	0.001 -	
BH20	0.9 - 1 m	24/03/24	<0.2	<0.5	<1	<1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			4 95	NL 135	NL 185	NL 95	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BH21	0.1 - 0.2 m	24/03/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	50 10	20 -	20 1	20 -	- -	
BH21	0.3 - 0.4 m	24/03/24	<0.2	<0.5	<1	<1	<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	-	-	-	-	-	<0.001	NAD
			4 95	NL 135	NL 185	NL 95	660 -	- 640	3,600 640	45 -	530 -	2,000 -	100 -	50 -	80 -	2,500 -	100 -	2,000 -	7 -	- -	- -	- -	- -	- -	0.001 -	
BH8 - [TRIPLICATE]	0.4 - 0.5 m	24/03/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	
BH20 - [TRIPLICATE]	0.4 - 0.5 m	24/03/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	

Lab result

HIL/HSL value EIL/ESL/EGV 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 **Red** = EGV-indirect exceedance HSL 0-<1 Exceedance

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

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

Notes:

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

b Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL

c EIL criteria applies to DDT only

Site Assessment Criteria (SAC):

SAC based on generic land use thresholds for Commercial/ industrial D

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

HIL	HIL-D (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
HSL (vapour ir	HSL-D (NEPC, 2013)	ESL	Commercial and Industrial (NEPC, 2013)
DC	Direct contact HSL D Commercial/Industrial (CRC CARE, 2011)	ML	Commercial and Industrial (NEPC, 2013)
		EGV-Indir	EGV, all land uses, Indirect exposure (HEPA, 2020)

Table G2: Summary of Laboratory Results – Waste Classification

				Metals																TRH	
				Total Arsenic	TCLP Total Arsenic	Cadmium	TCLP Cadmium	Total Chromium	TCLP Total Chromium	Copper	TCLP Copper	Lead	TCLP Lead	Mercury (inorganic)	TCLP Mercury (inorganic)	Nickel	TCLP Nickel	Zinc	TCLP Zinc	TRH C6 - C9	TRH C10-C36
			PQL	4	0.05	0.4	0.01	1	0.01	1	0.01	1	0.03	0.1	0.0005	1	0.02	1	0.02	25	50
Sample ID	Depth	Sample Date	Fill / Natural	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/kg
BH1	0.1 - 0.2 m	01/03/24	Fill	<4	-	<0.4	-	**14**	-	**60**	-	**9**	-	<0.1	-	**30**	-	**35**	-	<25	<50
BH1	1 - 1.1 m	01/03/24	Natural	**5**	-	<0.4	-	**16**	-	**13**	-	**17**	-	<0.1	-	**11**	-	**31**	-	<25	<50
BH2	0.1 - 0.2 m	09/03/24	Fill	<4	-	<0.4	-	**15**	-	**62**	-	**3**	-	<0.1	-	**61**	-	**40**	-	<25	<50
BH2	0.5 - 0.6 m	09/03/24	Natural	**4**	-	<0.4	-	**18**	-	**5**	-	**12**	-	<0.1	-	**5**	-	**9**	-	<25	<50
BD1/20240309	-	09/03/24	Blind Duplicate	**5**	-	<0.4	-	**19**	-	**5**	-	**13**	-	<0.1	-	**4**	-	**9**	-	<25	<50
BH3	0.1 - 0.2 m	10/03/24	Fill	<4	-	<0.4	-	**15**	-	**110**	-	**3**	-	<0.1	-	**7**	-	**36**	-	<25	**980**
BH4	0.1 - 0.2 m	10/03/24	Fill	<4	-	<0.4	-	**18**	-	**47**	-	**16**	-	<0.1	-	**32**	-	**49**	-	<25	**350**
BH5	0.1 - 0.2 m	10/03/24	Fill	<4	<0.05	<0.4	<0.01	**24**	<0.01	**52**	**0.07**	**21**	<0.03	<0.1	<0.0005	**90**	**0.24**	**49**	**0.04**	<25	**430**
BH5	1 - 1.1 m	10/03/24	Natural	<4	-	<0.4	-	**9**	-	**4**	-	**27**	-	<0.1	-	**4**	-	**16**	-	<25	<50
BH6	0.5 - 0.6 m	09/03/24	Fill	<4	<0.05	<0.4	<0.01	**14**	**0.02**	**61**	**0.04**	**1**	<0.03	<0.1	<0.0005	**88**	**0.06**	**44**	**0.08**	<25	<50
BH6	1.5 - 1.6 m	09/03/24	Natural	<4	-	<0.4	-	**10**	-	**31**	-	<1	-	<0.1	-	**54**	-	**25**	-	<25	<50
BH7	0.1 - 0.2 m	24/03/24	Fill	<4	-	<0.4	-	**16**	-	**72**	-	<1	-	<0.1	-	**92**	-	**34**	-	<25	**140**
BH7	0.9 - 1 m	24/03/24	Natural	**5**	-	<0.4	-	**19**	-	**11**	-	**21**	-	<0.1	-	**6**	-	**7**	-	<25	<50
BH8	0.3 - 0.4 m	24/03/24	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH8	0.4 - 0.5 m	24/03/24	Fill	**5**	-	<0.4	-	**13**	-	**22**	-	**19**	-	<0.1	-	**25**	-	**23**	-	<25	**2,300**
BH8	1.3 - 1.4 m	24/03/24	Natural	**6**	-	<0.4	-	**22**	-	**7**	-	**19**	-	<0.1	-	**8**	-	**9**	-	<25	<50
BD2/20240324 [ALS]	-	24/03/24	Blind Duplicate	**6**	-	<1	-	**22**	-	**6**	-	**20**	-	<0.1	-	**8**	-	**6**	-	<10	<50
BH9	0.5 - 0.7 m	24/03/24	Fill	**7**	-	<0.4	-	**35**	-	**55**	-	**30**	-	**0.3**	-	**3**	-	**93**	-	<25	<50
BH10	0.1 - 0.2 m	24/03/24	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH10	0.3 - 0.4 m	24/03/24	Fill	<4	-	<0.4	-	**15**	-	**2**	-	**16**	-	<0.1	-	**3**	-	**4**	-	<25	<50
BH11	0.1 - 0.2 m	24/03/24	Fill	<4	-	<0.4	-	**21**	-	**73**	-	<1	-	<0.1	-	**120**	**0.3**	**49**	-	<25	**210**
BH11	0.8 - 0.9 m	24/03/24	Natural	<4	-	<0.4	-	**14**	-	**11**	-	**16**	-	<0.1	-	**6**	-	**6**	-	<25	<50
BD3/20240324	-	24/03/24	Blind Duplicate	**5**	-	<0.4	-	**15**	-	**11**	-	**17**	-	<0.1	-	**5**	-	**6**	-	<25	<50
BH12	0.1 - 0.2 m	24/03/24	Fill	<4	-	<0.4	-	**18**	-	**62**	-	**22**	-	<0.1	-	**15**	-	**58**	-	<25	**320**
BH13	0 - 0.2 m	24/03/24	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH13	1 - 1.2 m	24/03/24	Natural	**4**	-	<0.4	-	**11**	-	**4**	-	**17**	-	<0.1	-	**2**	-	**9**	-	<25	<50
BH14	0.1 - 0.2 m	24/03/24	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH14	0.4 - 0.5 m	24/03/24	Fill	<4	-	<0.4	-	**15**	-	**63**	-	**32**	-	<0.1	-	**60**	**0.05**	**50**	-	<25	**1000**
BH15	0.3 - 0.5 m	24/03/24	Fill	**6**	-	<0.4	-	**17**	-	**18**	-	**43**	-	**0.4**	-	**5**	-	**39**	-	<25	<50
BH16	0.5 - 0.6 m	24/03/24	Fill	<4	-	<0.4	-	**13**	-	**37**	-	**24**	-	**0.4**	-	**59**	**0.04**	**42**	-	<25	<50
BH16	0.7 - 0.8 m	24/03/24	Fill	<4	-	<0.4	-	**12**	-	**23**	-	**44**	-	<0.1	-	**9**	-	**100**	-	<25	<50
BH17	0.4 - 0.5 m	24/03/24	Fill	<4	-	<0.4	-	**18**	-	**34**	-	**27**	-	<0.1	-	**50**	-	**44**	-	<25	<50
BH17	1.8 - 1.9 m	24/03/24	Natural	**4**	-	<0.4	-	**10**	-	**12**	-	**16**	-	<0.1	-	**2**	-	**7**	-	<25	<50
BD1/20240324	-	24/03/24	Blind Duplicate	**5**	-	<0.4	-	**10**	-	**11**	-	**16**	-	<0.1	-	**2**	-	**7**	-	<25	<50
BH18	0.5 - 0.7 m	24/03/24	Fill	**4**	-	<0.4	-	**16**	-	**6**	-	**59**	-	<0.1	-	**3**	-	**39**	-	<25	<50
BH19	0.4 - 0.5 m	24/03/24	Fill	**8**	-	<0.4	-	**15**	-	**8**	-	**41**	-	<0.1	-	**8**	-	**41**	-	<25	<50
BH19	0.9 - 1 m	24/03/24	Fill	<4	-	<0.4	-	**12**	-	**3**	-	**21**	-	<0.1	-	**2**	-	**20**	-	<25	<50
BH19	1.3 - 1.4 m	24/03/24	Natural	<4	-	<0.4	-	**8**	-	**3**	-	**12**	-	<0.1	-	**2**	-	**7**	-	<25	<50
BH20	0.1 - 0.2 m	24/03/24	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH20	0.4 - 0.5 m	24/03/24	Fill	<4	-	<0.4	-	**14**	-	**9**	-	**12**	-	<0.1	-	**15**	-	**16**	-	<25	<50
BH20	0.9 - 1 m	24/03/24	Fill	<4	-	<0.4	-	**8**	-	**27**	-	**82**	-	<0.1	-	**23**	-	**170**	-	<25	<50
BH21	0.1 - 0.2 m	24/03/24	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH21	0.3 - 0.4 m	24/03/24	Fill	<4	-	<0.4	-	**8**	-	**4**	-	**11**	-	<0.1	-	**6**	-	**14**	-	<25	<50
BH8 - [TRIPLICATE]	0.4 - 0.5 m	24/03/24	Laboratory Triplicate	<4	-	<0.4	-	**13**	-	**14**	-	**25**	-	<0.1	-	**20**	-	**26**	-	-	-
BH20 - [TRIPLICATE]	0.4 - 0.5 m	24/03/24	Laboratory Triplicate	<4	-	<0.4	-	**13**	-	**12**	-	**19**	-	<0.1	-	**20**	-	**26**	-	-	-

Table G2: Summary of Laboratory Results – Waste Classification

				Metals																TRH	
				Total Arsenic	TCLP Total Arsenic	Cadmium	TCLP Cadmium	Total Chromium	TCLP Total Chromium	Copper	TCLP Copper	Lead	TCLP Lead	Mercury (inorganic)	TCLP Mercury (inorganic)	Nickel	TCLP Nickel	Zinc	TCLP Zinc	TRH C6 - C9	TRH C10-C36
			PQL	4	0.05	0.4	0.01	1	0.01	1	0.01	1	0.03	0.1	0.0005	1	0.02	1	0.02	25	50
Sample ID	Depth	Sample Date	Fill / Natural	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/kg
Summary Statistics																					
Min				4	0.05	0.4	0.01	8	0.01	2	0.04	1	0.03	0.1	0.0005	2	0.06	4	0.04	25	50
Max				8	0.05	0.4	0.01	35	0.02	110	0.07	82	0.03	0.4	0.0005	120	0.24	170	0.08	25	2,300
Mean				4	0.05	0.4	0.01	15	0.02	28	0.06	21	0.03	0.1	0.0005	25	0.15	34	0.06	25	198
Waste Classification Criteria [f]																					
CT1				100	-	20	-	100	-	-	-	100	-	4	-	40	-	-	-	650	10,000
SCC1				500	-	100	-	1,900	-	-	-	1,500	-	50	-	1,050	-	-	-	650	10,000
TCLP1				-	5	-	1	-	5	-	-	-	5	-	0.2	-	2	-	-	-	-
CT2				400	-	80	-	400	-	-	-	400	-	16	-	160	-	-	-	2,600	40,000
SCC2				2,000	-	400	-	7,600	-	-	-	6,000	-	200	-	4,200	-	-	-	2,600	40,000
TCLP2				-	20	-	4	-	20	-	-	-	20	-	0.8	-	8	-	-	-	-
Published Background Concentrations																					
NEPC (1999)				1-50	-	1	-	5-1000	-	2-100	-	2-200	-	0.03	-	5-500	-	10-300	-	-	-
ANZECC (1992)				0.2-30	-	0.04-2	-	0.5-110	-	1-190	-	<2-200	-	0.001-0.1	-	2-400	-	2-180	-	-	-
ANZECC (2000)				1-53	-	0.016-0.78	-	2.5-673	-	0.4-412	-	2-81	-	-	-	1-517	-	1-263	-	-	-

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

- = Not tested, no criteria or not applicable NAD = no asbestos detected

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	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste
PQL	Practical quantitation limit
CT1	Maximum values of specific contaminant concentration (SCC) for classification without TCLP: General solid waste
SCC1	Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
TCLP1	Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
CT2	Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste
SCC2	Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
TCLP2	Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

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Table G2: Summary of Laboratory Result

				BTEX				PAH				Phenols	OCP					OPP	PCB	PFAS				Asbestos	
				Benzene	Toluene	Ethylbenzene	Total Xylenes	Benzo(a)pyrene (B(a)P)	TCLP Benzo(a)pyrene (B(a)P)	Total PAH	TCLP Total PAH	Total Phenolics	Scheduled Chemical Waste (standard)	Total Endosulfan	Total Analysed OCP	Mirex	Total Analysed OPP	Total PCB	PFOA	TCLP PFOA	PFOS + PFHxS	TCLP PFOS + PFHxS	Asbestos ID in soil >0.1g/kg	FA and AF Estimation
			PQL	0.2	0.5	1	1	0.05	0.0001	0.05		5	0.1	0.1	0.1	0.1	0.1	0.1	0.0001	0.00001	0.0001	0.00001		0.001
Sample ID	Depth	Sample Date	Fill / Natural	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/L	-	%(w/w)
BH1	0.1 - 0.2 m	01/03/24	Fill	<0.2	<0.5	<1	<1	<0.05	-	**0.2**	-	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.0001	-	**0.0002**	-	NAD	<0.001
BH1	1 - 1.1 m	01/03/24	Natural	<0.2	<0.5	<1	<1	<0.05	-	**0.2**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH2	0.1 - 0.2 m	09/03/24	Fill	<0.2	<0.5	<1	<1	<0.05	-	**0.3**	-	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	NAD	-
BH2	0.5 - 0.6 m	09/03/24	Natural	<0.2	<0.5	<1	<1	<0.05	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD1/20240309	-	09/03/24	Blind Duplicate	<0.2	<0.5	<1	<1	<0.05	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH3	0.1 - 0.2 m	10/03/24	Fill	<0.2	<0.5	<1	<1	**3.2**	<0.0001	**30**	**0.0001**	-	-	-	-	-	-	-	-	-	-	-	NAD	<0.001
BH4	0.1 - 0.2 m	10/03/24	Fill	<0.2	<0.5	<1	<1	**0.3**	-	**2.6**	-	-	-	-	-	-	-	-	<0.0001	-	**0.0002**	-	NAD	<0.001
BH5	0.1 - 0.2 m	10/03/24	Fill	<0.2	<0.5	<1	<1	**0.1**	-	**1**	-	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.0001	-	<0.0001	-	NAD	<0.001
BH5	1 - 1.1 m	10/03/24	Natural	<0.2	<0.5	<1	<1	**0.73**	-	**6.5**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH6	0.5 - 0.6 m	09/03/24	Fill	<0.2	<0.5	<1	<1	<0.05	-	<0.05	-	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	NAD	<0.001
BH6	1.5 - 1.6 m	09/03/24	Natural	<0.2	<0.5	<1	<1	<0.05	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH7	0.1 - 0.2 m	24/03/24	Fill	<0.2	<0.5	<1	<1	**0.06**	-	**0.3**	-	-	-	-	-	-	-	-	-	-	-	-	NAD	-
BH7	0.9 - 1 m	24/03/24	Natural	<0.2	<0.5	<1	<1	<0.05	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	NAD	-
BH8	0.3 - 0.4 m	24/03/24	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	<0.00001	**0.0001**	<0.00001	-	-
BH8	0.4 - 0.5 m	24/03/24	Fill	<0.2	<0.5	<1	<1	**22**	<0.0001	**210**	**0.0038**	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	NAD	<0.001
BH8	1.3 - 1.4 m	24/03/24	Natural	<0.2	<0.5	<1	<1	**0.5**	-	**4.4**	-	-	-	-	-	-	-	-	-	-	-	-	NAD	-
BD2/20240324 [ALS]	-	24/03/24	Blind Duplicate	<0.2	<0.5	<0.5	<0.5	<0.5	-	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH9	0.5 - 0.7 m	24/03/24	Fill	<0.2	<0.5	<1	<1	**0.62**	-	**4.3**	-	-	-	-	-	-	-	-	-	-	-	-	NAD	-
BH10	0.1 - 0.2 m	24/03/24	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	<0.0001	-	-	-
BH10	0.3 - 0.4 m	24/03/24	Fill	<0.2	<0.5	<1	<1	**0.09**	-	**0.58**	-	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	<0.001
BH11	0.1 - 0.2 m	24/03/24	Fill	<0.2	<0.5	<1	<1	**0.1**	-	**1.1**	-	-	-	-	-	-	-	-	-	-	-	-	NAD	-
BH11	0.8 - 0.9 m	24/03/24	Natural	<0.2	<0.5	<1	<1	<0.05	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	NAD	-
BD3/20240324	-	24/03/24	Blind Duplicate	<0.2	<0.5	<1	<1	<0.05	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH12	0.1 - 0.2 m	24/03/24	Fill	<0.2	<0.5	<1	<1	**0.1**	-	**1.1**	-	-	-	-	-	-	-	-	<0.0001	<0.00001	**0.0002**	<0.00001	NAD	-
BH13	0 - 0.2 m	24/03/24	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	<0.0001	-	-	-
BH13	1 - 1.2 m	24/03/24	Natural	<0.2	<0.5	<1	<1	**0.08**	-	**0.51**	-	-	-	-	-	-	-	-	-	-	-	-	NAD	-
BH14	0.1 - 0.2 m	24/03/24	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	<0.0001	-	-	-
BH14	0.4 - 0.5 m	24/03/24	Fill	<0.2	<0.5	<1	<1	**7.8**	<0.0001	**65**	**0.001**	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	NAD	<0.001
BH15	0.3 - 0.5 m	24/03/24	Fill	<0.2	<0.5	<1	<1	**1.5**	<0.0001	**17**	**0.0013**	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.0001	<0.00001	**0.0002**	<0.00001	NAD	<0.001
BH16	0.5 - 0.6 m	24/03/24	Fill	<0.2	<0.5	<1	<1	**0.2**	-	**2**	-	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	NAD	<0.001
BH16	0.7 - 0.8 m	24/03/24	Fill	<0.2	<0.5	<1	<1	**0.52**	-	**7.3**	-	-	-	-	-	-	-	-	-	-	-	-	NAD	-
BH17	0.4 - 0.5 m	24/03/24	Fill	<0.2	<0.5	<1	<1	**0.06**	-	**0.3**	-	-	-	-	-	-	-	-	-	-	-	-	NAD	<0.001
BH17	1.8 - 1.9 m	24/03/24	Natural	<0.2	<0.5	<1	<1	<0.05	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	NAD	-
BD1/20240324	-	24/03/24	Blind Duplicate	<0.2	<0.5	<1	<1	<0.05	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH18	0.5 - 0.7 m	24/03/24	Fill	<0.2	<0.5	<1	<1	**0.85**	-	**9.1**	-	-	-	-	-	-	-	-	-	-	-	-	NAD	-
BH19	0.4 - 0.5 m	24/03/24	Fill	<0.2	<0.5	<1	<1	**2**	<0.0001	**25**	**0.0035**	-	-	-	-	-	-	-	-	-	-	-	NAD	<0.001
BH19	0.9 - 1 m	24/03/24	Fill	<0.2	<0.5	<1	<1	**0.3**	-	**3.2**	-	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	NAD	<0.001
BH19	1.3 - 1.4 m	24/03/24	Natural	<0.2	<0.5	<1	<1	<0.05	-	<0.05	-	-	-	-	-	-	-	-	-	-	-	-	NAD	-
BH20	0.1 - 0.2 m	24/03/24	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	-	<0.0001	-	-	-
BH20	0.4 - 0.5 m	24/03/24	Fill	<0.2	<0.5	<1	<1	**0.2**	-	**1.4**	-	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	NAD	<0.001
BH20	0.9 - 1 m	24/03/24	Fill	<0.2	<0.5	<1	<1	**0.2**	-	**1.9**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH21	0.1 - 0.2 m	24/03/24	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.0001	<0.00001	<0.0001	<0.00001	-	-
BH21	0.3 - 0.4 m	24/03/24	Fill	<0.2	<0.5	<1	<1	<0.05	-	<0.05	-	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	NAD	<0.001
BH8 - [TRIPLICATE]	0.4 - 0.5 m	24/03/24	Laboratory Triplicate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH20 - [TRIPLICATE]	0.4 - 0.5 m	24/03/24	Laboratory Triplicate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Douglas PARTNERS

Table G2: Summary of Laboratory Result

				BTEX				PAH				Phenols	OCP				OPP	PCB	PFAS				Asbestos	
				Benzene	Toluene	Ethylbenzene	Total Xylenes	Benzo(a)pyrene (B(a)P)	TCLP Benzo(a)pyrene (B(a)P)	Total PAH	TCLP Total PAH	Total Phenolics	Scheduled Chemical Waste (standard)	Total Endosulfan	Total Analysed OCP	Mirex	Total Analysed OPP	Total PCB	PFOA	TCLP PFOA	PFOS + PFHxS	TCLP PFOS + PFHxS	Asbestos ID in soil >0.1g/kg	FA and AF Estimation
			PQL	0.2	0.5	1	1	0.05	0.0001	0.05		5	0.1	0.1	0.1	0.1	0.1	0.1	0.0001	0.00001	0.0001	0.00001		0.001
Sample ID	Depth	Sample Date	Fill / Natural	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/L	-	%(w/w)
Summary Statistics																								
Min				0.2	0.5	1	1	0.05	0.0001	0.05	0.0001	5	0.1	0.1	0.1	0.1	0.1	0.1	0.0001	0.00001	0.0001	0.00001	-	-
Max				107	107	106	1	22	0.0001	210	0.0001	5	0.1	0.1	0.1	0.1	0.1	0.1	0.0001	0.00001	0.0002	0.00001	-	-
Mean				5.5	5.8	6	1	1.17	0.0001	11	0.0001	5	0.1	0.1	0.1	0.1	0.1	0.1	0.0001	0.00001	0.0001	0.00001	-	-
Waste Classification Criteria [f]																								
CT1				10	288	600	1000	0.8	-	200	-	288	<50	60	-	-	4	<50	-	-	-	-	-	-
SCC1				18	518	1,080	1,800	10	-	200	-	518	<50	108	-	-	7.5	<50	18	-	1.8	-	-	-
TCLP1				-	-	-	-	-	0.04	-	-	-	-	-	-	-	-	-	-	0.5	-	0.5	-	-
CT2				40	1,152	2,400	4,000	3.2	-	800	-	1,152	<50	240	-	-	16	<50	-	-	-	-	-	-
SCC2				72	2,073	4,320	7,200	23	-	800	-	2,073	<50	432	-	-	30	<50	72	-	7.2	-	-	-
TCLP2				-	-	-	-	-	0.16	-	-	-	-	-	-	-	-	-	-	2	-	2	-	-
Published Background Concentrations																								
NEPC (1999)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ANZECC (1992)				0.05 - 1	0.1 - 1	-	-	-	-	0.95-5	-	0.03 - 0.5	-	-	-	-	-	0.02 - 0.1	-	-	-	-	-	-
ANZECC (2000)				-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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

- = Not tested, no criteria or not applicable NAD = no asbestos detected

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	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste
PQL	Practical quantitation limit
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TCLP1	Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: General solid waste
CT2	Maximum values of specific contaminant concentration (SCC) for classification without TCLP: Restricted solid waste
SCC2	Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste
TCLP2	Maximum values for leachable concentration (TCLP) and specific contaminant concentration (SCC) when used together: Restricted solid waste

Abstract from Mulvey et al (2006)

Abstract

Polycyclic aromatic hydrocarbons (PAH), which are nearly ubiquitous, result from a large number of processes. Knowing the source of PAHs in fill and soil assists understanding of bioavailability and facilitates remediation. For example, PAHs from boiler ash and coke are not readily available, while PAHs from soil impregnated with gasworks waste are very bioavailable. Using the understanding of their chemistry, the relationships between PAHs ar other hydrocarbons, and the proportions of individual PAHs; the source of the PAHs in fill ca be readily identified. Two statistical methods are used to delineate PAH source by ranking the degree of fit with known sources, are outlined. Understanding that more volatile, more biodegradable and more leachable compounds are lost at a greater rate, adjustments can be made for aging, enabling more accurate source delineation. In this paper, using the two methods as an example of the procedure, we compare several unknown samples with know reference samples from waste oil, steel works coke ovens and manufactured gasworks waste, as well as creosote from timber preservation, processed PAHs, ash from black coal, ash from brown coal and diesel. This paper also poses two questions: should furnace-fired PAHs be removed to landfills (remediated) when fireplace ash is ubiquitous and so much of our urban soil is currently "carcinogenic"? When different waste streams from gasworks or other PAH generating industries have different remediation criteria, should PAH sources an their inherent bioavailability be considered in deriving health risk assessment guidelines?.

How to:

Enter PAH data into the table in the Home tab. Results are presented in Method A and Method B

Note that if pyrene results are <PQL, Method B may not calculate meaningful results, and will only

Data input field (not used in calculation)

Data input field (Used in calculation)

Note: Enter values manually c

Note: Max 22 samples (yellow

Don't transpose or copy/drag

Inclusion in reports

Include PDF of this spreadsheet (excluding this page)

Limitations:

Refer to paper by Mulvey et al (2006) for limitations and assumptions associated with these metho assumption that the reference database are typical of those materials and that the signature of th similar relative concentrations. The second assumption is known to fall down sometimes, for exam or volatilsation has occurred resuting in loss of lighter end PAHs. A further complicating factor is P mixture of hydrocarbons (which may be present during formation of introduced as a secondary sc solubilise PAHs particularly the lighter end PAHs resulting in different PAH signatures. The metho source which is often not the case.

It is noted that often there can be several close fits within classes, that is coke and ash are both py not between classes, such heated petrogenic residues will not produce a close fit for an unknown

Refer tp Table 1 in Mulvey et al (2006) for Classes and associated materials.

Regardless of the results, good quality field observation and descriptions should be obtained and t
methods. TRH chromatogragh interpretation in conjunction with field observations and this PAH t

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tabs - compare outcome of both
output results if the PQL method is 0.5 or 1xPQL

or paste directly in from another spreadsheet (e.g. douglas file). Exclude BaP TEQ results
input field only)
cells after entereting etc as you may inadvertently alter calculations in background and have erro

odologies. These include the
ıe test material will follow
ıple where biodegradation
AHs are often present in a
ource) and which can
ds also assume a single PAH

rogenic residues, but usually
with pyrogenic residues.

take precedence over these
fingerprint analysis should

rs in output.

PAH Fingerprint V1.8

Correlation of field PAH data to reference datasets

Project: Proposed ICoE **Project No:** 227190.01

Location: 171 Victoria Road, Rydalmere

Interpreting Results

Method A: closest to 1 = strongest correlation

Method B: closest to 0 = strongest correlation

Method A	- Correlation Coefficient'	*This method assumes that the data from two PAH suites of results will have a positive correlation if they are from a similar source*
Method B	- Summed absolute difference of pyrene normalised data'	*This method normalises both the test and reference data sets against pyrene. As pyrene is relatively stable, less prone to volatilisation and produced in relatively large concentreations in most PAH forming processes, it is considered an ideal substance against which to make comparison.*

Non-detect method	1	*Determines handling of results <PQL. Options for: results as 0 (DEFAULT), 0.5 x PQL or 1 x PQL*

Sample ID	Depth (m)	Naphthalene	Acenaphthylene	Acenaphthene	Fluorene	Phenanthrene	Anthracene	Fluoranthene	Pyrene	Benzo(a)anthracene	Chrysene	Benzo(b,j&k)fluoranthene	Benzo(a)pyrene	Indeno(1,2,3-c,d)pyrene	Dibenzo(a,h)anthracene	Benzo(g,h,i)perylene	Total +ve PAH's
BH3	0.1-0.2	<0.1	0.4	0.1	0.1	2.4	0.9	4.8	4.6	2.4	2.0	4.6	3.2	1.8	0.5	2.4	30
BH4	0.1-0.2	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	0.5	0.5	0.2	0.2	0.4	0.3	0.1	<0.1	0.2	2.6
BH5	0.1-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	0.2	<0.1	<0.1	0.2	0.1	<0.1	<0.1	0.2	1.0
BH5	1-1.1	<0.1	0.2	<0.1	<0.1	0.6	0.2	1.1	1.0	0.5	0.5	1	0.73	0.3	<0.1	0.4	6.5
BH7	0.1-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.2	0.06	<0.1	<0.1	<0.1	0.3
BH8	0.4-0.5	0.4	3.7	0.4	0.5	7.1	4.0	33	39	26	15	31	22	9.6	2.9	11	210
BH8	1.3-1.4	<0.1	0.1	<0.1	<0.1	0.2	0.1	0.7	0.8	0.5	0.3	0.7	0.5	0.2	<0.1	0.2	4.4
BH9	0.5-0.7	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.4	0.5	0.6	0.4	0.9	0.62	0.3	<0.1	0.4	4.3
BH10	0.3-0.4	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.2	0.2	<0.1	<0.1	<0.2	0.09	<0.1	<0.1	<0.1	0.58
BH11	0.1-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.2	0.1	0.1	0.2	0.1	<0.1	<0.1	0.2	1.1
BH12	0.1-0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.3	0.2	0.1	0.2	0.1	<0.1	<0.1	<0.1	1.1
BH13	1-1.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.2	0.1	<0.1	<0.2	0.08	<0.1	<0.1	<0.1	0.51
BH14	0.4-0.5	0.4	2.3	0.1	0.3	3.5	1.9	7.5	9.4	7.8	4.3	11	7.8	3.4	1.4	4.1	65
BH15	0.3-0.5	0.3	0.5	0.2	0.6	2.3	0.5	2.4	2.5	1.1	1.2	2.1	1.5	0.7	0.2	0.9	17
BH16	0.5-0.6	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.4	0.4	0.2	0.2	0.4	0.2	<0.1	<0.1	0.1	2.0
BH16	0.7-0.8	0.1	0.3	<0.1	0.2	1.2	0.3	1.1	1.1	0.8	0.4	0.8	0.52	0.2	<0.1	0.3	7.3
BH17	0.4-0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1	<0.1	<0.2	0.06	<0.1	<0.1	<0.1	0.3
BH18	0.5-0.7	0.2	0.2	<0.1	0.1	0.9	0.3	1.3	1.4	1.0	0.6	1	0.85	0.4	<0.1	0.5	9.1
BH19	0.4-0.5	0.2	<0.1	<0.1	0.3	3.5	1.0	4.3	4.2	2.9	1.4	3.0	2.0	0.8	<0.1	1	25
BH19	0.9-1	<0.1	<0.1	<0.1	<0.1	0.4	0.1	0.6	0.6	0.2	0.2	0.5	0.3	0.1	<0.1	0.2	3.2
BH20	0.4-0.5	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	0.3	0.2	0.1	0.1	0.2	0.2	<0.1	<0.1	0.1	1.4
BH20	0.9-1	<0.1	<0.1	<0.1	<0.1	0.4	<0.1	0.3	0.3	0.2	0.2	0.3	0.2	<0.1	<0.1	<0.1	1.9

Reference

Inline: Philip & McKay (2006)

Full: Philip, M., & McKay, C. (2006), Source characterization and identification as a means of assessing the type of bonding in the soil and its subsequent impact on bioavailability. Proceedings of the International Symposium and Exhibition on the Redevelopment of Manufactures Gas Plant Sites 14 (2), pp. 412-425. Reading, UK: Land Contamination & Reclamation.

Website: Online copy of Philip & McKay (2006)

Excel Version

Version 1.7

Date 18/01/2023

Last Updated by: LC/JRR/JJH

PAH Fingerprint V1.8

Project No: 227190.01
Project: Proposed ICoE
Location: 171 Victoria Road, Rydalmere

Table 1: Results for PAH Fingerprinting Method A (Correlation Coefficient)

	BH3/0.1-0.2	BH4/0.1-0.2	BH5/0.1-0.2	BH5/1-1.1	BH7/0.1-0.2	BH8/0.4-0.5	BH8/1.3-1.4	BH9/0.5-0.7	BH10/0.3-0.4	BH11/0.1-0.2	BH12/0.1-0.2
Black Coal Tar 1	0.05	0.11	0.08	0.14	0.22	-0.03	0.03	-0.13	0.20	0.04	0.07
Black Coal Tar 2	0.55	0.59	0.38	0.61	0.12	0.47	0.52	0.24	0.48	0.34	0.47
Brown Coal Tar	-0.30	-0.18	-0.16	-0.23	-0.06	-0.31	-0.25	-0.37	-0.11	-0.20	-0.14
Steelworks Tar 1	0.42	0.48	0.43	0.49	0.07	0.30	0.34	0.00	0.44	0.36	0.36
Steelworks Tar 2	0.38	0.52	0.58	0.44	0.08	0.38	0.42	0.10	0.56	0.48	0.45
Weathered Coal Tar	0.29	0.28	0.12	0.36	0.02	0.14	0.17	-0.12	0.20	0.07	0.18
Creosote 1	0.28	0.37	0.35	0.37	-0.08	0.16	0.21	-0.21	0.34	0.18	0.24
Creosote 2	-0.09	0.04	0.04	0.00	-0.07	-0.17	-0.09	-0.39	0.08	-0.05	0.01
Weathered Creosote	0.36	0.43	0.35	0.44	-0.05	0.25	0.29	-0.13	0.38	0.22	0.32
Ash from Black Coal 1	0.91	0.93	0.78	0.93	0.16	0.89	0.88	0.58	0.80	0.71	0.77
Ash from Black Coal 2	0.92	0.92	0.69	0.95	0.21	0.87	0.87	0.57	0.78	0.65	0.77
Ash from Black Coal 3	0.94	0.94	0.73	0.95	0.24	0.90	0.91	0.66	0.80	0.71	0.77
Ash from Brown Coal	0.96	0.94	0.72	0.96	0.12	0.94	0.92	0.71	0.73	0.68	0.75
Bitumen	0.09	0.08	0.10	0.10	0.15	-0.01	0.00	0.10	0.00	0.17	-0.09
Coke	0.97	0.96	0.75	0.98	0.26	0.96	0.95	0.73	0.82	0.72	0.80
Waste Oil Petrol	0.55	0.43	0.51	0.47	0.53	0.48	0.43	0.62	0.42	0.71	0.40
Waste Oil Diesel	0.69	0.80	0.60	0.72	0.07	0.73	0.71	0.24	0.73	0.61	0.75

	BH13/1-1.2	BH14/0.4-0.5	BH15/0.3-0.5	BH16/0.5-0.6	BH16/0.7-0.8	BH17/0.4-0.5	BH18/0.5-0.7	BH19/0.4-0.5	BH19/0.9-1	BH20/0.4-0.5	BH20/0.9-1
Black Coal Tar 1	0.20	-0.02	0.27	0.11	0.31	0.22	0.16	0.23	0.25	0.28	0.37
Black Coal Tar 2	0.48	0.43	0.75	0.49	0.75	0.12	0.67	0.74	0.70	0.67	0.78
Brown Coal Tar	-0.10	-0.35	-0.11	-0.20	-0.08	-0.06	-0.17	-0.12	-0.10	-0.05	0.00
Steelworks Tar 1	0.44	0.24	0.65	0.35	0.69	0.07	0.54	0.63	0.62	0.63	0.68
Steelworks Tar 2	0.56	0.26	0.43	0.49	0.41	0.08	0.44	0.44	0.51	0.53	0.33
Weathered Coal Tar	0.21	0.12	0.63	0.15	0.71	0.02	0.44	0.59	0.50	0.50	0.76
Creosote 1	0.34	0.04	0.56	0.24	0.65	-0.08	0.42	0.57	0.55	0.63	0.67
Creosote 2	0.09	-0.26	0.19	-0.04	0.26	-0.07	0.07	0.18	0.20	0.27	0.35
Weathered Creosote	0.39	0.14	0.65	0.30	0.73	-0.05	0.50	0.65	0.61	0.64	0.74
Ash from Black Coal 1	0.79	0.78	0.90	0.87	0.84	0.16	0.92	0.91	0.92	0.81	0.78
Ash from Black Coal 2	0.77	0.81	0.98	0.84	0.95	0.21	0.97	0.98	0.97	0.86	0.91
Ash from Black Coal 3	0.78	0.84	0.94	0.88	0.86	0.24	0.95	0.94	0.95	0.84	0.83
Ash from Brown Coal	0.71	0.87	0.91	0.86	0.83	0.12	0.96	0.92	0.91	0.81	0.77
Bitumen	0.00	0.00	0.16	0.03	0.07	0.15	0.10	0.08	0.13	0.01	0.23
Coke	0.80	0.90	0.92	0.92	0.85	0.26	0.96	0.92	0.94	0.81	0.79
Waste Oil Petrol	0.44	0.53	0.48	0.42	0.38	0.53	0.44	0.37	0.43	0.12	0.41
Waste Oil Diesel	0.73	0.52	0.80	0.76	0.74	0.07	0.74	0.74	0.79	0.56	0.74

Notes

	Result ≥0.95 =	Very Good Fit
1 ≤	Result <0.95 =	Good Fit
1 ≤	Result <0.85 =	Reasonable Fit
	Result <0.75 =	Poor Fit

Project No: 227190.01
Project: Proposed ICoE
Location: 171 Victoria Road, Rydalmere

Table 2: Results for PAH Fingerprinting Method B (pyrene normalised, sum of absolute differences)

	BH3/0.1-0.2	BH4/0.1-0.2	BH5/0.1-0.2	BH5/1-1.1	BH7/0.1-0.2	BH8/0.4-0.5	BH8/1.3-1.4	BH9/0.5-0.7	BH10/0.3-0.4	BH11/0.1-0.2	BH12/0.1-0.2
Black Coal Tar 1	9.44	9.36	8.67	8.74	8.53	9.96	9.57	10.83	8.43	8.91	9.53
Black Coal Tar 2	3.32	2.93	4.68	3.16	7.98	3.26	3.00	6.47	3.73	4.18	3.48
Brown Coal Tar	17.16	16.06	16.31	16.60	17.87	17.23	16.87	19.98	15.33	15.88	15.91
Steelworks Tar 1	4.37	3.87	4.06	4.02	7.86	5.03	4.67	7.39	3.37	3.89	3.89
Steelworks Tar 2	3.99	3.72	3.35	3.85	8.13	4.70	4.43	7.12	3.08	3.58	3.69
Weathered Coal Tar	5.68	4.77	6.77	5.34	10.41	5.60	5.27	8.64	5.72	6.27	5.22
Creosote 1	7.78	6.84	7.50	7.37	12.01	7.78	7.47	10.88	7.45	8.00	6.99
Creosote 2	10.76	9.82	10.59	10.35	13.77	10.77	10.45	13.86	10.36	10.91	10.08
Weathered Creosote	5.99	5.38	6.77	5.71	11.56	6.00	5.86	9.42	6.44	6.99	5.82
Ash from Black Coal 1	1.94	2.08	5.08	2.04	10.78	1.69	2.15	5.72	4.26	4.81	3.21
Ash from Black Coal 2	1.62	1.65	4.93	1.66	10.06	1.42	1.64	5.55	3.88	4.43	2.89
Ash from Black Coal 3	1.57	1.28	4.28	1.46	9.68	1.66	1.65	4.92	3.33	3.78	2.61
Ash from Brown Coal	1.21	1.73	4.73	1.54	10.13	1.37	1.75	5.05	3.78	4.23	3.11
Bitumen	10.43	10.89	10.33	10.36	10.84	11.64	11.26	10.00	10.38	9.83	11.33
Coke	1.10	1.38	4.33	1.23	9.89	1.01	1.34	4.80	3.43	3.88	2.83
Waste Oil Petrol	3.95	5.10	6.10	4.63	9.41	3.67	4.23	4.12	6.05	5.60	5.13
Waste Oil Diesel	3.87	3.75	7.15	4.08	12.73	2.66	3.28	6.77	6.10	6.65	4.15

	BH13/1-1.2	BH14/0.4-0.5	BH15/0.3-0.5	BH16/0.5-0.6	BH16/0.7-0.8	BH17/0.4-0.5	BH18/0.5-0.7	BH19/0.4-0.5	BH19/0.9-1	BH20/0.4-0.5	BH20/0.9-1
Black Coal Tar 1	8.48	9.68	8.43	8.88	8.39	8.53	9.09	9.19	9.13	8.17	7.56
Black Coal Tar 2	3.78	4.17	2.23	3.28	2.22	7.98	2.55	2.63	2.84	3.98	2.63
Brown Coal Tar	15.28	17.87	15.70	16.09	15.35	17.87	16.35	15.98	15.89	15.81	15.34
Steelworks Tar 1	3.36	5.30	3.40	4.28	3.23	7.86	4.02	3.98	3.70	3.60	3.39
Steelworks Tar 2	3.09	4.93	3.86	4.06	4.02	8.13	3.88	4.24	3.81	3.81	4.72
Weathered Coal Tar	5.67	6.55	4.29	5.04	4.14	10.41	4.79	4.50	4.47	6.27	4.77
Creosote 1	7.40	8.86	6.60	7.09	6.25	12.01	7.09	6.29	6.34	7.00	6.65
Creosote 2	10.31	11.85	9.58	10.16	9.34	13.77	10.09	9.34	9.32	10.09	9.75
Weathered Creosote	6.39	7.09	4.98	5.74	4.60	11.56	5.52	4.53	4.81	6.27	5.49
Ash from Black Coal 1	4.21	2.89	2.23	2.53	2.55	10.78	1.99	1.70	2.01	5.58	4.18
Ash from Black Coal 2	3.88	2.53	1.34	2.18	1.40	10.06	1.16	0.83	1.20	4.96	3.46
Ash from Black Coal 3	3.38	2.42	1.19	1.83	1.94	9.68	1.05	1.41	1.24	4.58	3.11
Ash from Brown Coal	3.83	2.09	1.72	2.36	2.45	10.13	1.37	1.65	2.00	5.00	3.63
Bitumen	10.43	10.23	10.25	10.75	10.44	10.84	10.64	11.09	11.06	10.28	9.00
Coke	3.48	1.90	1.40	1.72	1.98	9.89	1.18	1.32	1.45	4.80	3.29
Waste Oil Petrol	6.00	3.54	5.14	4.85	5.40	9.41	4.55	4.84	5.27	7.60	6.10
Waste Oil Diesel	6.05	4.17	3.99	3.90	4.26	12.73	3.69	3.41	3.65	7.65	6.13

Notes

	Result ≤ 1.5 =	Very Good Fit
2 ≤	Result <3 =	Good Fit
3 ≤	Result <5 =	Reasonable Fit
	Result > 5 =	Poor Fit

Appendix H

Logs

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW

SURFACE LEVEL: 8.1 AHD
COORDINATE: E:317339.2, N:6257241.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH1
PROJECT No: 227190.00
DATE: 01/03/24 - 02/03/24
SHEET: 1 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS
	8	0.10	ASPHALTIC CONCRETE: wearing surface			NA	NA		A/ES		0.10		
			FILL / Sandy GRAVEL: grey; fine to medium; fine to coarse sand; (probably roadbase).		FILL	(WC)	D to M		A/ES		0.50		
		0.60			FILL								
		0.70	FILL / CLAY AND GRAVEL; mixture.										
	7	1	CLAY (CI-CH): grey mottled orange-brown; medium to high plasticity.		ALV	F	w>PL		A/ES		1.00	SPT	0,2,3 N=5
									A/ES		1.50		
		2.00	CLAY (CI-CH): grey stained red-brown; medium to high plasticity.						A		2.00		
	6				ALV				A		2.50	SPT	4,5,7 N=12
	5	3									3		
		3.55	CORE LOSS: 650mm										
	4	4.20	CLAY (CI-CH): grey stained red-brown; medium to high plasticity.		ALV						4		
		4.50	CORE LOSS: 900mm			St	w<PL						
	3	5									5		
		5.40	CLAY (CI-CH): grey stained red-brown; medium to high plasticity.		ALV								
		5.80	CORE LOSS: 1200mm										
	2	6									6		
		7.00	CLAY (CI-CH): grey stained red-brown; medium to high plasticity.		ALV						7		
Possible seepage between 7.2m and 7.9m during auger drilling 01/03/24	1	7.20											
		7.40	CORE LOSS: 200mm		ALV								
		7.74	Sandy CLAY (CI): grey and dark grey mottled red-brown; medium plasticity; fine to medium sand; with iron-cemented bands; possibly tertiary-aged alluvium.										
	0	7.88									8	PP	80kPa
			CORE LOSS: 140mm										
			Sandy CLAY (CI): grey and dark grey; medium plasticity; fine sand.		ALV	F	w=PL						
	-1	9									9	PP	85kPa
												PP	90kPa
		9.85	Continued as rock										
	-2	10									10		

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: Comacchio 205
METHOD: AD/T to 2.5m; NMLC to 15.9m
REMARKS:

OPERATOR: Terratest

LOGGED: JBC/CC/AK
CASING: HW to 2.5m

Generated with CORE-GS by Geroc - Split Soil-Rock Log

Refer to explanatory notes for symbol and abbreviation definitions

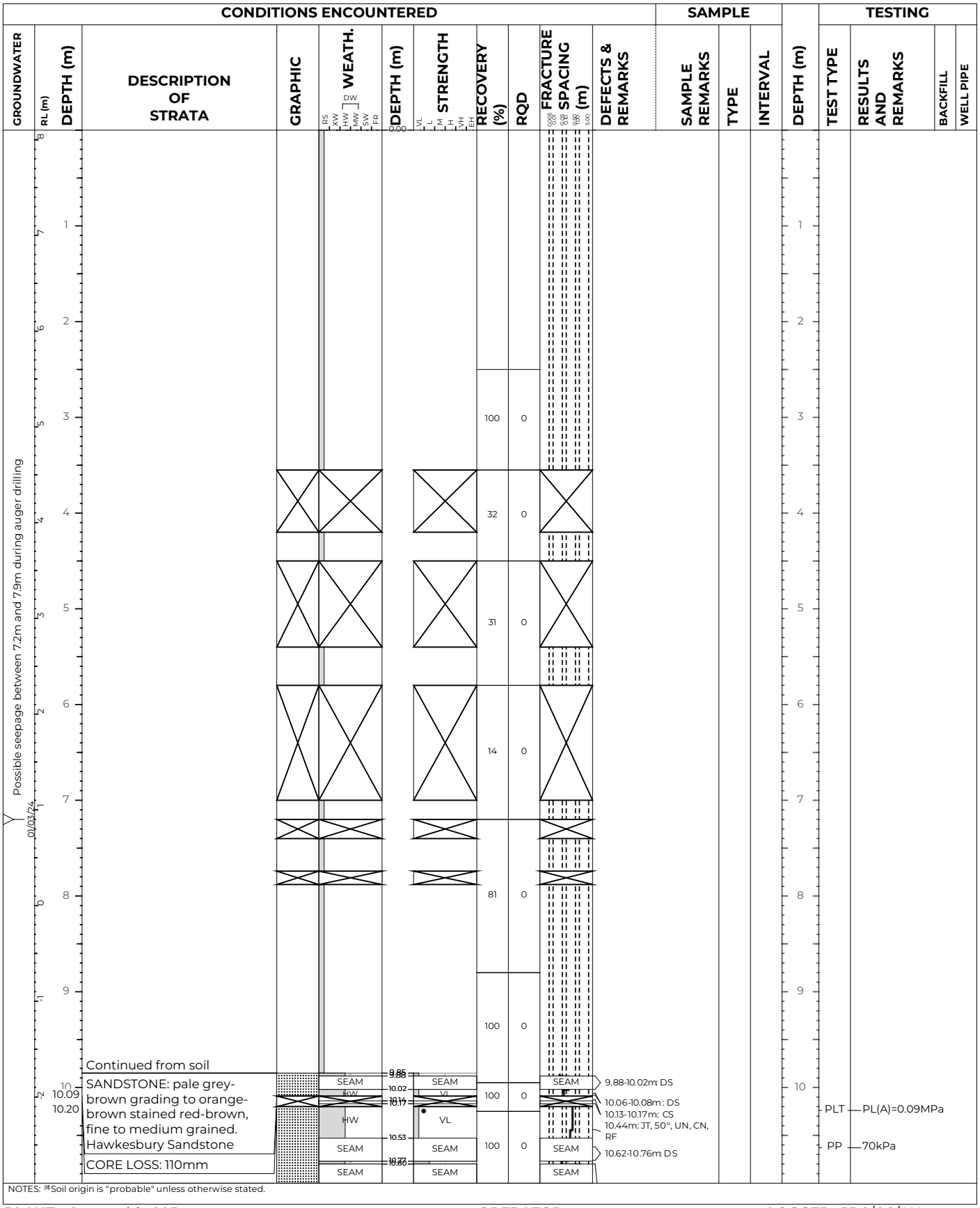
Douglas PARTNERS

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW

SURFACE LEVEL: 8.1 AHD
COORDINATE: E:317339.2, N:6257241.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH1
PROJECT No: 227190.00
DATE: 01/03/24 - 02/03/24
SHEET: 2 of 3



NOTES: [a] Soil origin is "probable" unless otherwise stated.

PLANT: Comacchio 205
METHOD: AD/T to 2.5m; NMLC to 15.9m
REMARKS:

OPERATOR: Terratest

LOGGED: JBC/CC/AK
CASING: HW to 2.5m

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW

SURFACE LEVEL: 8.1 AHD
COORDINATE: E:317339.2, N:6257241.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH1
PROJECT No: 227190.00
DATE: 01/03/24 - 02/03/24
SHEET: 3 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH. (DW: PS, XW, HW, MW, SW, FR)	DEPTH (m)	STRENGTH (VL, L, M, H, VH, EH)	RECOVERY (%)	RQD	FRACTURE SPACING (m) (0.03, 0.06, 0.2, 0.6, 2.00)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
	-3		SANDSTONE: pale grey-brown grading to orange-brown stained red-brown, fine to medium grained. Hawkesbury Sandstone		SEAM		SEAM	88	0	SEAM	10.80-11.96m: DS					PP — 115kPa			
	-4	12			HW	11.96	L								12	PLT — PL(A)=0.06MPa			
					SEAM	12.08	SEAM	100	0	SEAM	12.08m: B, 5°, PR, SN, RF 12.10-12.64m: DS					PP — 145kPa			
	-5	13			MW	12.64	H	100	83		12.71m: B, 10°, PR, CN, RF 13.34m: B, 10°, UN, CN, RF				13	PLT — PL(A)=1.1MPa			
	-6	14						100	100						14	PLT — PL(A)=1MPa			
		14.40	SANDSTONE: brown, fine to medium grained. Hawkesbury Sandstone		HW	14.39 14.42	H				14.39m: B, 5°, PR, SN, RF 14.39-14.42m: CS								
	-7	15 15.13	SANDSTONE: pale grey stained orange-brown, medium to coarse grained. Hawkesbury Sandstone		SW	15.13	H	100	51		15.06-15.13m: B x4 x, 5-10°, UN, SN CBS, RF 15.20m: B, 10°, ST, CN, RF				15				
					SW to MW	15.49	H				15.49-15.50m: CS 15.55m: B, 0°, PR, CN, RF 15.57m: B, 5°, PR, CN, RF					PLT — PL(A)=0.96MPa			
	-8	16	Borehole discontinued at 15.90m depth. Limit of investigation.																
	-9	17																	
	-10	18																	
	-11	19																	
	-12	20																	
	-13	21																	

NOTES: [a] Soil origin is "probable" unless otherwise stated.

PLANT: Comacchio 205
METHOD: AD/T to 2.5m; NMLC to 15.9m
REMARKS:

OPERATOR: Terratest

LOGGED: JBC/CC/AK
CASING: HW to 2.5m

Refer to explanatory notes for symbol and abbreviation definitions

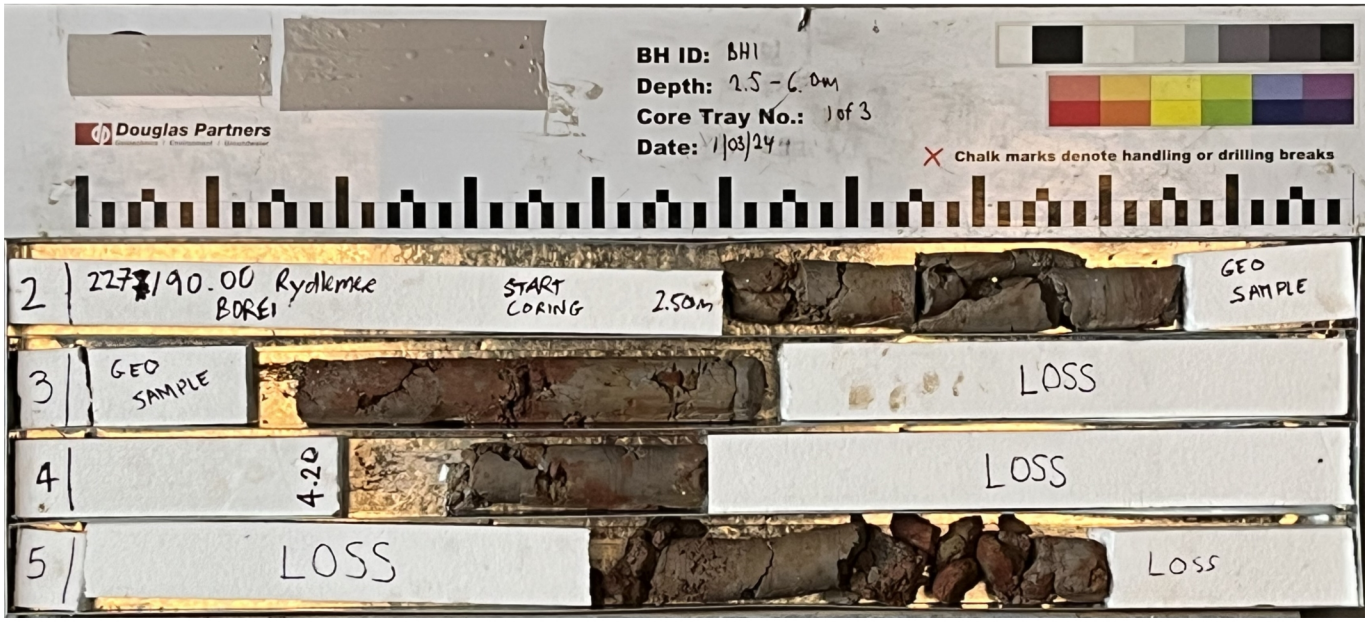
Douglas PARTNERS

CORE PHOTO LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW

SURFACE LEVEL: 8.1 AHD
COORDINATE: E:317339.2, N:6257241.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH1
PROJECT No: 227190.00
DATE: 01/03/24 - 02/03/24
SHEET: 1 of 2



Box 1 of 3: 2.50-6.00 m depth

Box 2 of 3: 6.00-11.00 m depth

CORE PHOTO LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW

SURFACE LEVEL: 8.1 AHD
COORDINATE: E:317339.2, N:6257241.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH1
PROJECT No: 227190.00
DATE: 01/03/24 - 02/03/24
SHEET: 2 of 2

Box 3 of 3: 11.00-15.90 m depth

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW

SURFACE LEVEL: 7.9 AHD
COORDINATE: E:317401.5, N:6257243.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH2
PROJECT No: 227190.00
DATE: 09/03/24
SHEET: 1 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
		0.02	ASPHALTIC CONCRETE: 20mm thick wearing surface		FILL	(WC)	D		ES		0.10			Bentonite Concrete Flush cover	
		0.30	FILL / SAND: dark grey and dark brown; with igneous gravel; trace silt and asphalt fragments; slight bituminous odour.			St			* ES		0.50				
	7		CLAY (CI-CH): brown, red-brown and pale grey; medium to high plasticity; trace rootlets .						ES		1.00	SPT	4,6,8 N=14		50mm
		1							ES		1.50				
	6					VSt			ES		2.00				
24/03/24		2							* ES		2.50	SPT	3,7,10 N=17		
	5								ES		3.00				
		3	From 3.50m: trace silt			H			ES		3.50				
	4		From 4.00m: bands of iron cemented soil (ironstone)		ALV				ES		4.00				
									U50		4.45			Gravel	
	3											SPT	8,18,14 N=32		50mm
		5					w=PL		ES		5.00				
									ES		5.50				
	2	6							ES		6.00	SPT	5,8,14 N=22		
			From 6.50m: trace fine to medium sand			VSt			ES		6.50				
	1	7							ES		7.00				
	0											PP	235-205kPa		
		8									8				
		8.50	Silty CLAY (CI): grey mottled red-brown and orange-brown; medium plasticity.									PP	370-340kPa	Bentonite	
	-1	9			ALV	VSt to H					9				
												PP	410kPa		

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: Comacchio MC450 P1
OPERATOR: Terratest
LOGGED: JBC/AK
METHOD: AD/T to 7.5m; NMLC to 17.9m
CASING: HW to 7.5m
REMARKS: *Field Replicate BD1/20243009 taken from 0.5m, BD02/20240309 taken from 2.5m

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Split Soil-Rock Log

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW

SURFACE LEVEL: 7.9 AHD
COORDINATE: E:317401.5, N:6257243.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH2
PROJECT No: 227190.00
DATE: 09/03/24
SHEET: 2 of 3

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	BACKFILL	WELL PIPE
	10 / 2	[CONT] Silty CLAY (CI): grey mottled red-brown and orange-brown; medium plasticity. From 9.60m: dark-grey mottled red-brown and brown		ALV	VSt to H	w=PL				10	PP	455-375kPa	Gravel	
	11 / 3									11	PP	370-340kPa		
	11.93 / 4	Clayey SAND (SC): grey; fine to medium; medium plasticity clay.		ALV	(D)	W				12				
	12.90 / 5	Continued as rock								13				
	14 / 6									14				
	15 / 7									15				
	16 / 8									16				
	17 / 9									17				
	18 / 10									18				
	19 / 11									19				

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: Comacchio MC450 P1
OPERATOR: Terratest
LOGGED: JBC/AK
METHOD: AD/T to 7.5m; NMLC to 17.9m
CASING: HW to 7.5m
REMARKS: *Field Replicate BD1/20243009 taken from 0.5m, BD02/20240309 taken from 2.5m

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW

SURFACE LEVEL: 7.9 AHD
COORDINATE: E:317401.5, N:6257243.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH2
PROJECT No: 227190.00
DATE: 09/03/24
SHEET: 3 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS	SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	BACKFILL	WELL PIPE
	-2	10						100	0						10				
	-3	11													11				
	-4	12						100	11		12.50m: , Unless otherwise noted, defects are B, 0-10 degrees, PR, RF, CN				12				
	-5	13	Continued from soil SANDSTONE: pale grey-brown, fine to medium grained. Hawkesbury Sandstone		SW MW	12.90 13.35	M				13.03m: B, 10°, PR, SN, RF 13.43m: B, PR, VNR Clay, RF				13	PLT	PL(A)=1.5MPa	Gravel	
	-6	14			SEAM SW SEAM	13.85 14.02 14.45	SEAM L to M SEAM			SEAM	13.85-14.35m: DS, Clay 14.40m: JT, 70°, UN, INF Clay 3mm, RF 14.45-14.65m: DS, Clay				14	PLT	PL(A)=0.25MPa		
	-7	14.70	CORE LOSS: 300mm			14.70		87	79						15				
		15.00	SANDSTONE: pale grey-brown stained orange-brown and red-brown, fine to medium grained. Hawkesbury Sandstone		MW SEAM	15.00 15.30 15.43	L to M SEAM			SEAM	15.18m: B, PR, SN CBS, RF					PLT	PL(A)=0.35MPa		
		15.43 15.61				15.61 15.66					15.61-15.66m: DS, Clay								
	-8		CORE LOSS: 170mm		SW		M												
		16	SANDSTONE: pale grey-brown stained orange-brown, fine to medium grained. Hawkesbury Sandstone		SW SW to FR	16.70	M								16	PLT	PL(A)=0.94MPa		
	-9	17.03	SANDSTONE: orange-brown stained red-brown, medium to coarse grained. Hawkesbury Sandstone		MW SEAM MW MW	17.03 17.33 17.49 17.60	SEAM H H	100	97	SEAM	16.98m: B, UN, CN, RF 17.17m: B, 5°, UN, CN, RF 17.33-17.49m: DS 17.60m: CS				17	PLT	PL(A)=0.46MPa		
	-10	18	Borehole discontinued at 17.90m depth. Limit of investigation.																
	-11	19																	

NOTES: [a] Soil origin is "probable" unless otherwise stated.

Generated with CORE-GS by Geroc - Split Soil-Rock Log

PLANT: Comacchio MC450 P1
METHOD: AD/T to 7.5m; NMLC to 17.9m
REMARKS: *Field Replicate BD1/20243009 taken from 0.5m, BD02/20240309 taken from 2.5m

OPERATOR: Terratest

LOGGED: JBC/AK
CASING: HW to 7.5m

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

CORE PHOTO LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW

SURFACE LEVEL: 7.9 AHD
COORDINATE: E:317401.5, N:6257243.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH2
PROJECT No: 227190.00
DATE: 09/03/24
SHEET: 1 of 2

Box 1 of 3: 7.50-12.00 m depth

Box 2 of 3: 12.00-17.00 m depth

CORE PHOTO LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW

SURFACE LEVEL: 7.9 AHD
COORDINATE: E:317401.5, N:6257243.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH2
PROJECT No: 227190.00
DATE: 09/03/24
SHEET: 2 of 2

Biox 3 of 3: 17.00-17.90 m depth

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW

SURFACE LEVEL: 7.9 AHD
COORDINATE: E:317335.0, N:6257209.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH3
PROJECT No: 227190.00
DATE: 10/03/24
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
	0.05	CONCRETE AND ROADBASE GRAVEL						ES		0.10		
		FILL / CLAY, SAND AND GRAVEL.		FILL	(VC)	D / w<PL		A/ES		0.50		
	1.10							A/ES		1.00	SPT	2,4,4 N=8
		FILL / GRAVELLY SANDSTONE, SAND AND GRAVEL.		FILL								
	1.50	Sandy CLAY (CH): grey-brown; high plasticity; medium sand.		ALV	St	w<PL		A/ES		1.50		
								A/ES		2.00		
								A		2.50	SPT	3,6,10 N=16
	2.80	CLAY (CI): dark grey mottled red and brown; medium plasticity; trace sand. Teritary alluvium.		ALV				A		3.00		
								A		3.50		
											SPT	9,10,13 N=23
	4.50	CLAY (CH): dark grey mottled red and brown; high plasticity. Tertiary alluvium.						A		4.50		
								A		5.00		
											SPT	8,14,16 N=30
					VSt	w=PL		A		6.00		
								A		6.50		
				ALV							SPT	5,8,11 N=19
								A		7.50		
								A		8.00		
											SPT	7,8,11 N=19
		Borehole discontinued at 10.00m depth. Limit of investigation - hole caved in.								9		

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: Comacchio 405
METHOD: AD/T to 10.0m
REMARKS:

OPERATOR: Terratest

LOGGED: CC
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW

SURFACE LEVEL: 7.7 AHD
COORDINATE: E:317412.8, N:6257216.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH4
PROJECT No: 227190.00
DATE: 10/03/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	DEPTH (m)	TESTING TEST TYPE	TESTING RESULTS AND REMARKS
	7	0.05	ASPHALTIC CONCRETE: wearing surface FILL / CLAY AND GRAVEL; mixture.		FILL	(VC)	D / w<PL		ES		0.10		
		0.50	CLAY (CI): orange-brown; medium plasticity; trace sand .		ALV				A/ES		0.50		
	1										1	SPT	6,9,11 N=20 no recovery
	6								A/ES		1.50		
	2						w<PL		A/ES		2.00		
		2.50	CLAY (CI-CH): red and grey grading to grey mottled brown and red; medium to high plasticity; trace fine sand.									SPT	6,8,11 N=19
	5												
	3				ALV	VSt			A		3.00		
	4								A		3.50		
▼ 10/03/24			From 4.00m-5.00m: pale grey-brown										
	4								A		4.00	SPT	7,10,14 N=24
	3						w=PL		A		4.50		
		5.00	CLAY (CH): dark red; high plasticity.										
	2				ALV				A		5.00		
									A		5.50	SPT	7,9,11 N=20
	6						w>PL		A		6.00		
	1	6.50	CLAY (CH): dark grey; high plasticity; with sand .		ALV	H			A		6.50		
	7										7		
		7.20	SAND (SP): grey; fine to medium; with low plasticity fines.		RS	D	M to W					SPT	12,16,18 N=34
	0												
	8										8		
	-1		Borehole discontinued at 8.50m depth. Limit of investigation - due to sidewall collapse below 7.2m.									SPT	no sample and recovery
	9												
	-2												

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: Comacchio 405
METHOD: AD/T to 8.50m
REMARKS:

OPERATOR: Terratest

LOGGED: CC
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW

SURFACE LEVEL: 7.9 AHD
COORDINATE: E:317336.6, N:6257172.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH5
PROJECT No: 227190.00
DATE: 10/03/24
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	BACKFILL	WELL PIPE
	7	0.05	ASPHALTIC CONCRETE: wearing surface FILL / CLAY AND GRAVEL; mixture.		FILL	(WC)	D / w<PL		ES		0.10			Bentonite Concrete Flush cover	
									A/ES		0.50				
		0.70	CLAY (CI): grey mottled brown; medium plasticity; with sand.		ALV										
		1.00	CLAY (CI); medium plasticity; with sand; medium quartz; well sorted. Alluvium.				w<PL		A/ES		1.00				
	6				ALV	St			A/B/ES		1.20	SPT	4,5,6 N=11		
24/03/24		2.00	Sandy CLAY (CL): grey; low plasticity; fine sand.								2				
	5					F			A/ES		2.50	SPT	3,3,4 N=7 No recovery	Gravel	50mm
		3	From 3.00m: brown mottled red-brown		RS		w=PL				3				
	4					VSt									
		4									4	SPT	6,9,18 N=27		
		4.45	SANDSTONE: orange-grey mottled red-brown, fine to medium grained; distinctly weathered. Hawkesbury Sandstone												
	3	5	Borehole discontinued at 4.50m depth. Limit of investigation.												
	2	6													
	1	7													
	0	8													
	-1	9													
	-2														

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: Comacchio 405
METHOD: AD/T to 4.5m
REMARKS:

OPERATOR: Terratest

LOGGED: CC
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW

SURFACE LEVEL: 7.3 AHD
COORDINATE: E:317407.8, N:6257178.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH6
PROJECT No: 227190.00
DATE: 09/03/24
SHEET: 1 of 2

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	BACKFILL	WELL PIPE
	7	0.05	ASPHALTIC CONCRETE: wearing surface											Concrete Flush cover	
			FILL / Gravelly SAND: grey; fine to coarse; fine to medium gravel.		FILL	(WC)	D								
		0.50	FILL / CLAY AND GRAVEL; mixture.		FILL	(VC)	M / w<PL								
	6	1.00	FILL / CLAY: pale brown-orange; medium plasticity; with fine to medium sand.		FILL	(WC)	w<PL				1	SPT	4,8,18 N=26		
		1.50	Sandy CLAY (CI): orange-brown; medium plasticity; fine to medium sand.		ALV	(VSt)	D							Backfill	
	5	2.00	Clayey SAND (SC): orange-brown mottled red-brown; fine to medium; low plasticity clay.		ALV possibly RS	(MD)	D to M				2			Bentonite	
		2.50	Clayey SAND (SC): red-brown; medium to coarse; low plasticity clay.		RS	MD					3	SPT	12,10,9 N=19		50mm
	4	3.10	Clayey SAND (SC): pale grey-brown; medium to coarse; low plasticity clay; extremely weathered sandstone.		XWM	(VD)	D								
	3	4.10	Continued as rock								4				
▼ 24/03/24	2	5									5			Gravel	
	1	6									6				
	0	7									7				50mm
	-1	8									8				
	-2	9									9				
	-3	10									10				

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: Comacchio 405
METHOD: AD/T to 4.1m; NMLC to 9.85m
REMARKS:

OPERATOR: Terratest

LOGGED: CC/AK
CASING: HW to 4.1m

Refer to explanatory notes for symbol and abbreviation definitions

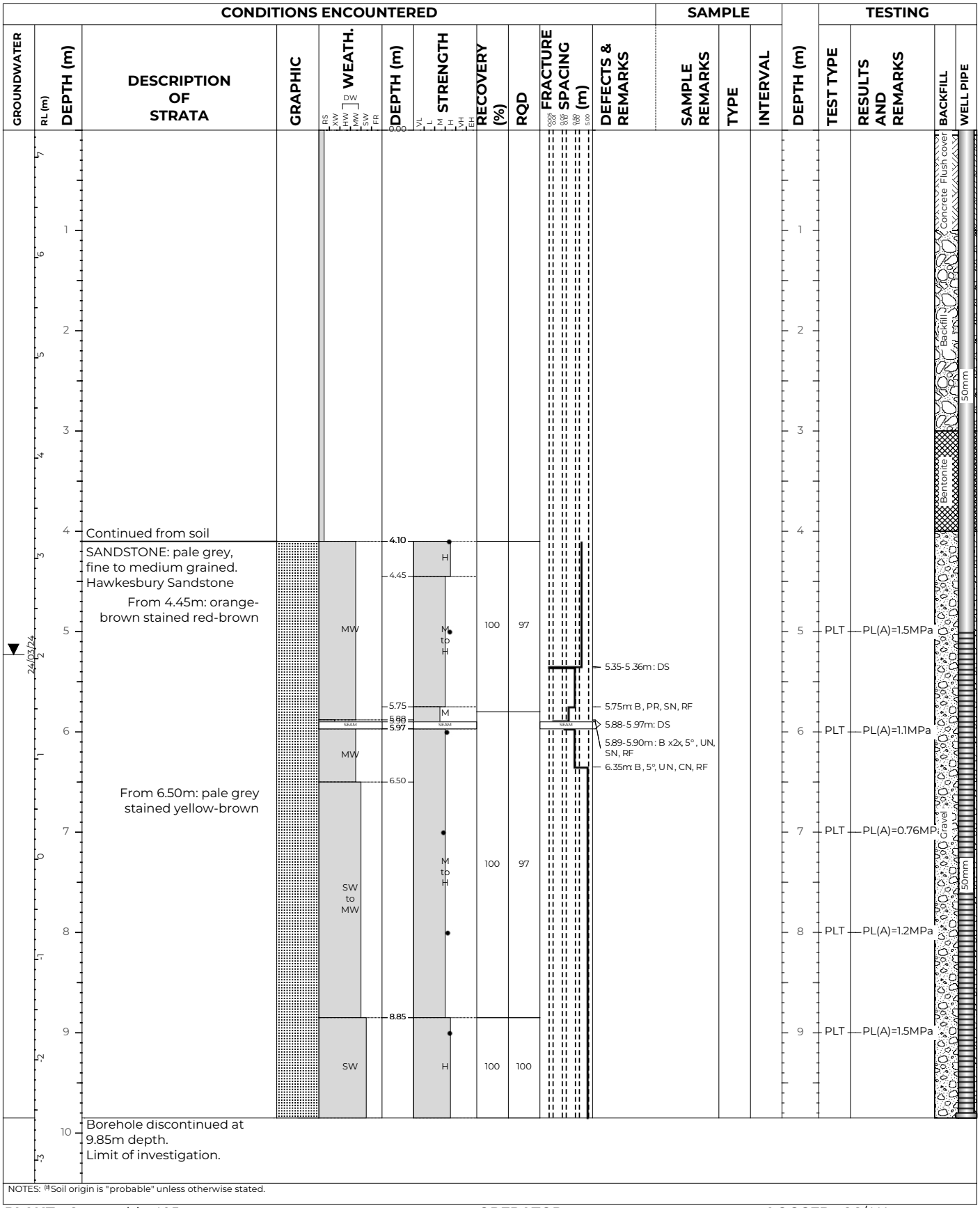
Generated with CORE-GS by Geroc - Split Soil-Rock Log

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW

SURFACE LEVEL: 7.3 AHD
COORDINATE: E:317407.8, N:6257178.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH6
PROJECT No: 227190.00
DATE: 09/03/24
SHEET: 2 of 2



NOTES: [a] Soil origin is "probable" unless otherwise stated.

Generated with CORE-GS by Geroc - Split Soil-Rock Log

PLANT: Comacchio 405
METHOD: AD/T to 4.1m; NMLC to 9.85m
REMARKS:

OPERATOR: Terratest

LOGGED: CC/AK
CASING: HW to 4.1m

Refer to explanatory notes for symbol and abbreviation definitions

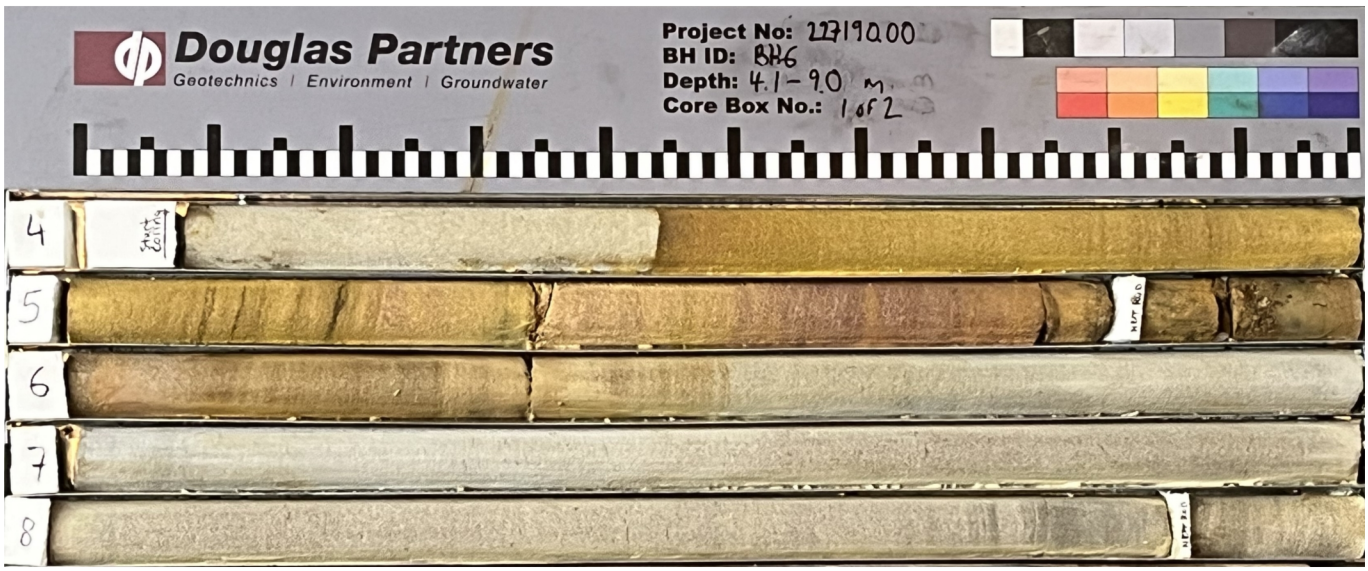
Douglas PARTNERS

CORE PHOTO LOG

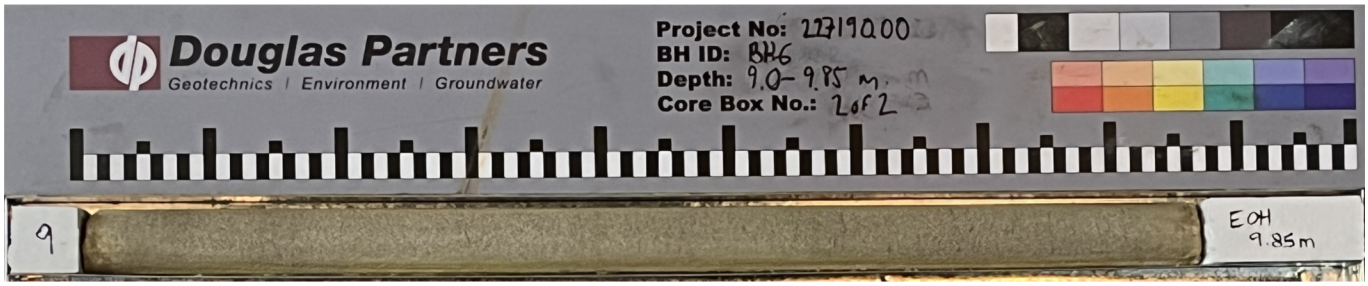
CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW

SURFACE LEVEL: 7.3 AHD
COORDINATE: E:317407.8, N:6257178.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH6
PROJECT No: 227190.00
DATE: 09/03/24
SHEET: 1 of 1



Box 1 of 2: 4.10-9.00 m depth



Box 2 of 2: 9.00-9.85 m depth

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 7.9 AHD
COORDINATE: E:317371.6, N:6257242.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH07
PROJECT No: 227190.01
DATE: 24/03/24
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
24/03/24 No free groundwater observed whilst drilling	0.03	ASPHALT (30 mmm)			NA	NA						
		FILL / Gravelly SAND: dark grey; fine to coarse; fine to coarse, igneous gravel; trace asphalt fragments.		FILL		M		ES		0.10	PID	2ppm
										0.20		
	0.40	CLAY (CI-CH): brown and dark brown mottled red-brown; medium to high plasticity; trace iron cemented stone.						ES		0.50	PID	2ppm
										0.60		
	7	0.80m: Pale grey and red-brown			ND							
	1			RS		w=PL		ES		0.90	PID	3ppm
										1.00		
										1.40		
								ES			PID	4ppm
										1.50		
		Borehole discontinued at 1.50m depth. Target depth reached.										
	6											
	2											
	5											

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: Geoprobe with 150 mm solid flight auger
METHOD: Solid flight auger to 1.5 m
REMARKS:

OPERATOR: Terratest

LOGGED: JBC
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 8.0 AHD
COORDINATE: E:317334.1, N:6257225.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH08
PROJECT No: 227190.01
DATE: 24/03/24
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
24/03/24 No free groundwater observed whilst drilling		0.03	ASPHALT (25 mm)			NA	NA						
			FILL / Gravelly SAND: dark grey; fine to coarse; fine to coarse, igneous gravel; trace asphalt fragments.		FILL		M						
		0.30	FILL / Silty SAND, trace gravel: pale grey and brown; fine to medium; sandstone gravel.		FILL				ES		0.30	PID	4ppm
		0.40	FILL / Silty CLAY, trace sand, trace gravel: dark brown and grey; low to medium plasticity.		FILL				ES		0.40	PID	4ppm
											0.50		
		0.70	CLAY (CI-CH), trace sand, trace gravel: dark grey and brown; medium to high plasticity; siltstone gravel.		ALV	ND	w=PL		ES		0.80	PID	4ppm
	7	1									0.90		
											1		
			1.30m: Becoming brown mottled dark brown						ES		1.30	PID	3ppm
											1.40		
	6	2	Borehole discontinued at 1.50m depth. Target depth reached.										
	5												

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: Geoprobe with 150 mm solid flight auger
METHOD: Solid flight auger to 1.5 m
REMARKS: Blind duplicate BD2/20240324 taken from 1.3 - 1.4 m.

OPERATOR: Terratest
LOGGED: JBC
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 7.7 AHD
COORDINATE: E:317361.3, N:6257227.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH09
PROJECT No: 227190.01
DATE: 24/03/24
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
24/03/24 No free groundwater observed whilst drilling	7	0.03	ASPHALT (25 mm)			NA	NA						
			FILL / Gravelly SAND: dark grey; fine to coarse; fine to coarse, igneous gravel; trace asphalt fragments.		FILL		M		ES		0.20	PID	2ppm
		0.30	FILL / CLAY: brown and grey; low to medium plasticity.		FILL		w<PL		ES		0.50	PID	3ppm
						ND					0.70		
		0.80	Silty CLAY (CI-CH): brown mottled red-brown; medium to high plasticity.		ALV				ES		0.80	PID	1ppm
	1	1.10	CLAY (CI-CH): grey; medium to high plasticity.		RS		w=PL				1.00		
									ES		1.30	PID	1ppm
			Borehole discontinued at 1.50m depth. Target depth reached.								1.50		
	6												
	2												
	5												

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: 5t Excavator with 300 mm solid flight auger
METHOD: Solid flight auger to 1.5 m
REMARKS:

OPERATOR: A&A Hire

LOGGED: SAF
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 7.6 AHD
COORDINATE: E:317378.8, N:6257229.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH10
PROJECT No: 227190.01
DATE: 24/03/24
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
24/03/24 No free groundwater observed whilst drilling	7	0.03	ASPHALT (25 mm)			NA	NA				0.10		
			FILL / Gravelly SAND: dark grey; fine to coarse; fine to coarse, igneous gravel; trace asphalt fragments.		FILL		M		ES		0.20	PID	4ppm
		0.30	FILL / CLAY, trace gravel: brown and dark yellow-brown; medium to high plasticity; siltstone gravel; trace iron cemented stone, possibly natural.		FILL				ES		0.30	PID	4ppm
											0.40		
		0.60	CLAY (CI-CH): brown and yellow-brown; medium to high plasticity; trace iron cemented stone.		ALV	ND	w=PL		ES		0.70	PID	3ppm
	1										0.80		
		1.20	CLAY (CI-CH): pale grey and red-brown; medium to high plasticity.		RS				ES		1.20	PID	3ppm
	6		Borehole discontinued at 1.50m depth. Target depth reached.								1.30		
	2												
	5												

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: Geoprobe with 150 mm solid flight auger
METHOD: Solid flight auger to 1.5 m
REMARKS:

OPERATOR: Terratest
LOGGED: JBC
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 7.8 AHD
COORDINATE: E:317395.7, N:6257230.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH11
PROJECT No: 227190.01
DATE: 24/03/24
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
24/03/24 No free groundwater observed whilst drilling	7	0.03	ASPHALT (25 mm)			NA	NA				0.10		
			FILL / Gravelly SAND: dark grey; fine to coarse; fine to coarse, igneous gravel; trace asphalt fragments.		FILL		M		ES		0.20	PID	3ppm
		0.30	CLAY (CI-CH), trace sand: brown mottled red-brown; medium to high plasticity; trace iron cemented stone.		ALV				ES		0.30	PID	3ppm
						ND					0.40		
		0.80	CLAY (CI-CH): pale grey and red-brown; medium to high plasticity; trace iron cemented stone.		RS		w=PL		ES		0.80	PID	3ppm
	6	1									0.90		
											1		
									ES		1.30	PID	3ppm
	5	2	Borehole discontinued at 1.50m depth. Target depth reached.								1.40		

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: Geoprobe with 150 mm solid flight auger
METHOD: Solid flight auger to 1.5 m
REMARKS: Blind duplicate BD3/20240324 taken from 0.8 - 0.9 m.

OPERATOR: Terratest

LOGGED: JBC
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 7.9 AHD
COORDINATE: E:317411.6, N:6257231.6
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH12
PROJECT No: 227190.01
DATE: 24/03/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
24/03/24 No free groundwater observed whilst drilling		0.03	ASPHALT (25 mm)			NA	NA						
			FILL / Gravelly SAND: dark grey; fine to coarse; fine to coarse, igneous gravel; trace asphalt fragments.		FILL		M		ES		0.10	PID	2ppm
											0.20		
		0.40	CLAY (CI-CH), trace sand: red-brown and brown; medium to high plasticity; trace iron cemented stone.		ALV				ES		0.40	PID	3ppm
											0.50		
		0.80	CLAY (CI-CH): pale grey and red-brown; medium to high plasticity; trace iron cemented stone.		RS	ND	w=PL		ES		0.90	PID	3ppm
	7	1									1.00		
									ES		1.40	PID	3ppm
			Borehole discontinued at 1.50m depth. Target depth reached.								1.50		
	6	2											
	5												

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: Geoprobe with 150 mm solid flight auger
METHOD: Solid flight auger to 1.5 m
REMARKS:

OPERATOR: Terratest

LOGGED: JBC
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 7.7 AHD
COORDINATE: E:317352.8, N:6257204.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH13
PROJECT No: 227190.01
DATE: 24/03/24
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
24/03/24 No free groundwater observed whilst drilling		0.03	ASPHALT (25 mm)			NA	NA						
			FILL / Gravelly SAND: dark grey; fine to coarse; fine to coarse, igneous gravel; trace asphalt fragments.		FILL		M		ES		0.20	PID	2ppm
		0.20	FILL / Silty SAND, trace gravel: brown; fine to medium; igneous gravel.		FILL	ND	D		ES		0.50	PID	3ppm
											0.70		
		1.00	FILL / Silty CLAY: pale grey to pale brown; low to medium plasticity; trace rootlets.		FILL		w<PL		ES		1.00	PID	4ppm
		1.30	Silty CLAY (CI-CH): grey; medium to high plasticity.		RS		w=PL		ES		1.20		
											1.50	PID	4ppm
			Borehole discontinued at 1.80m depth. Target depth reached.								1.70		

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: 5t Excavator with 300 mm solid flight auger
METHOD: Solid flight auger to 2 m
REMARKS:

OPERATOR: A&A Hire

LOGGED: SAF
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 7.5 AHD
COORDINATE: E:317380.9, N:6257208.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH14
PROJECT No: 227190.01
DATE: 24/03/24
SHEET: 1 of 3

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*)	DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
24/03/24 No free groundwater observed whilst drilling	7	0.03	ASPHALT (25 mm)			NA		NA						
			FILL / Gravelly SAND: dark grey; fine to coarse; fine to coarse, igneous gravel; trace asphalt fragments.		FILL			M		ES		0.10 0.20	PID	3ppm
		0.30	FILL / Sandy CLAY, trace gravel: dark brown; low to medium plasticity; fine to coarse sand; igneous gravel; trace asphalt fragments.		FILL					ES		0.40 0.50	PID	3ppm
		0.70	CLAY (CI-CH): brown mottled red-brown; medium to high plasticity; trace iron cemented stone.							ES		0.90 1.00	PID	4ppm
	6	1	0.90m: Becoming brown, pale grey mottled red-brown							ES		1.40 1.50	PID	4ppm
			1.20m: Pale grey and red-brown											
							ND							
								w=PL						
					ALV possibly RS									
	5	2										2		
	4	3										3		
	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: Geoprobe with 150 mm solid flight auger
METHOD: Solid flight auger to 13.2 m
REMARKS:

OPERATOR: Terratest

LOGGED: JBC
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 7.5 AHD
COORDINATE: E:317380.9, N:6257208.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH14
PROJECT No: 227190.01
DATE: 24/03/24
SHEET: 2 of 3

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
	2 / 6	[CONT] CLAY (CI-CH): brown mottled red-brown; medium to high plasticity; trace iron cemented stone.		ALV possibly RS	ND		w=PL				6		
	1 / 7										7		
	0 / 8										8		
	-1 / 9						w>PL				9		
	-2												

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: Geoprobe with 150 mm solid flight auger
METHOD: Solid flight auger to 13.2 m
REMARKS:

OPERATOR: Terratest

LOGGED: JBC
CASING: Nil

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 7.5 AHD
COORDINATE: E:317380.9, N:6257208.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH14
PROJECT No: 227190.01
DATE: 24/03/24
SHEET: 3 of 3

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
	-3 / 11	[CONT] CLAY (CI-CH): brown mottled red-brown; medium to high plasticity; trace iron cemented stone.		ALV possibly RS	ND		w>PL				11		
	-4 / 12										12		
	-5 / 13										13		
	-6 / 14	Borehole discontinued at 13.20m depth. Refusal on bedrock.											
	-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.

PLANT: Geoprobe with 150 mm solid flight auger
METHOD: Solid flight auger to 13.2 m
REMARKS:

OPERATOR: Terratest
LOGGED: JBC
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

Douglas PARTNERS

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 7.5 AHD
COORDINATE: E:317397.5, N:6257209.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH15
PROJECT No: 227190.01
DATE: 24/03/24
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
24/03/24 No free groundwater observed whilst drilling		0.03	ASPHALT (25 mm)			NA	NA						
			FILL / Gravelly SAND: dark grey; fine to coarse; fine to coarse, igneous gravel; trace asphalt fragments.		FILL		M		ES		0.20	PID	3ppm
		0.30	FILL / Silty CLAY, trace gravel: dark brown and dark grey; low to medium plasticity; igneous gravel.		FILL	ND	w<PL		ES		0.30	PID	3ppm
	7										0.50		
									ES		0.80	PID	3ppm
	1										1.00		
		1.10	Silty CLAY (CI-CH): brown with grey mottling; medium to high plasticity.		ALV		w=PL		ES		1.30	PID	3ppm
	6										1.50		
			Borehole discontinued at 1.60m depth. Target depth reached.										
	2												
	5												

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: 5t Excavator with 300 mm solid flight auger
METHOD: Solid flight auger to 1.6 m
REMARKS:

OPERATOR: A&A Hire

LOGGED: SAF
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 7.5 AHD
COORDINATE: E:317414.1, N:6257200.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH16
PROJECT No: 227190.01
DATE: 24/03/24
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
24/03/24 No free groundwater observed whilst drilling		0.03	ASPHALT (25 mm)			NA	NA						
			FILL / Gravelly SAND: pale brown and dark grey; fine to coarse; fine to coarse, igneous gravel; trace asphalt fragments.		FILL		M		ES		0.10 0.20	PID	2ppm
	7	0.30	FILL / Sandy CLAY, trace gravel: dark brown; low to medium plasticity; fine to coarse sand; igneous gravel; trace asphalt fragments, ceramic fragment.		FILL		w=PL		ES		0.50 0.60	PID	2ppm
		0.70	FILL / Silty SAND, trace gravel; fine to medium; igneous gravel.		FILL	ND	M		ES		0.70 0.80	PID	2ppm
		1.00	CLAY (CI-CH): pale grey and red-brown; medium to high plasticity.		ALV possibly RS		w=PL		ES		1 1.10 1.20	PID	2ppm
	6		Borehole discontinued at 1.50m depth. Target depth reached.										
	2												
	5												

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: Geoprobe with 150 mm solid flight auger
METHOD: Solid flight auger to 1.5 m
REMARKS:

OPERATOR: Terratest

LOGGED: JBC
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 7.8 AHD
COORDINATE: E:317331.4, N:6257189.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH17
PROJECT No: 227190.01
DATE: 24/03/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	SAMPLE DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS
24/03/24 No free groundwater observed whilst drilling		0.03	ASPHALT (25 mm)			NA	NA						
			FILL / Gravelly SAND: dark grey; fine to coarse; fine to coarse, igneous gravel; trace asphalt fragments.		FILL		M		ES		0.10 0.20	PID	3ppm
		0.30	FILL / CLAY, trace sand, trace gravel: dark brown and red-brown; low to medium plasticity; fine to medium, igneous and siltstone gravel.		FILL		w=PL		ES		0.40 0.50	PID	3ppm
	7								ES		0.90 1.00	PID	3ppm
		1				ND							
		1.20	CLAY (CI-CH), trace gravel: pale grey mottled yellow-brown; medium to high plasticity; fine to medium, siltstone gravel.		ALV		w>PL		ES		1.20 1.30	PID	2ppm
	6								ES		1.80 1.90	PID	3ppm
		2	Borehole discontinued at 2.00m depth. Target depth reached.										
	5												

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: Geoprobe with 150 mm solid flight auger
METHOD: Solid flight auger to 3 m
REMARKS: Blind duplicate BD1/20240324 taken from 1.8 - 1.9 m.

OPERATOR: Terratest
LOGGED: JBC
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 7.6 AHD
COORDINATE: E:317353.8, N:6257186.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH18
PROJECT No: 227190.01
DATE: 24/03/24
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
24/03/24 No free groundwater observed whilst drilling	7	0.03	ASPHALT (25 mm)			NA	NA						
			FILL / Gravelly SAND: dark grey; fine to coarse; fine to coarse, igneous gravel; trace asphalt fragments.		FILL		M		ES		0.20	PID	3ppm
		0.20	FILL / Silty SAND, trace clay, trace gravel: dark brown; fine to coarse; igneous gravel.		FILL	ND	D		ES		0.50	PID	2ppm
											0.70		
		0.90	Silty CLAY (CI-CH): grey; medium to high plasticity.		ALV possibly RS		w<PL		ES		1.00	PID	3ppm
	6	1									1.20		
									ES		1.50	PID	3ppm
											1.70		
	5	2	Borehole discontinued at 1.70m depth. Target depth reached.										

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: 5t Excavator with 300 mm solid flight auger
METHOD: Solid flight auger to 1.7 m
REMARKS:

OPERATOR: A&A Hire

LOGGED: SAF
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 7.4 AHD
COORDINATE: E:317382.0, N:6257188.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH19
PROJECT No: 227190.01
DATE: 24/03/24
SHEET: 1 of 1

GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS.(*) / DENSITY.(*)	MOISTURE	REMARKS	SAMPLE TYPE	SAMPLE INTERVAL	SAMPLE DEPTH (m)	TESTING AND REMARKS: TEST TYPE	TESTING AND REMARKS: RESULTS AND REMARKS
24/03/24 No free groundwater observed whilst drilling	7	0.03	ASPHALT (25 mm)			NA	NA						
			FILL / Gravelly SAND: dark grey; fine to coarse; fine to coarse, igneous gravel; trace asphalt fragments.		FILL		M		ES		0.10	PID	2ppm
		0.30									0.20		
			FILL / CLAY, with sand, trace gravel: brown and yellow-brown; low to medium plasticity; igneous gravel.		FILL				ES		0.40	PID	2ppm
											0.50		
		0.80	FILL / Sandy CLAY: yellow-brown; low to medium plasticity; medium to coarse sand; possibly natural.		FILL				ES		0.90	PID	3ppm
	6	1				ND					1.00		
		1.10	CLAY (CI-CH): dark grey; medium to high plasticity; slight sulfidic odour.		ALV		w=PL		ES		1.30	PID	3ppm
											1.40		
									ES		1.80	PID	3ppm
	5	2	Borehole discontinued at 2.00m depth. Target depth reached.								1.90		

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: Geoprobe with 150 mm solid flight auger
METHOD: Solid flight auger to 2 m
REMARKS:

OPERATOR: Terratest

LOGGED: JBC
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 7.3 AHD
COORDINATE: E:317405.2, N:6257190.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH20
PROJECT No: 227190.01
DATE: 24/03/24
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
24/03/24 No free groundwater observed whilst drilling	7	0.03	ASPHALT (25 mm)			NA	NA				0.10		
			FILL / Gravelly SAND: dark grey; fine to coarse; fine to coarse, igneous gravel; trace asphalt fragments.		FILL		M		ES		0.20	PID	2ppm
		0.30	FILL / CLAY, trace sand: pale brown and brown mottled red-brown; low to medium plasticity; trace asphalt fragments.		FILL		w=PL		ES		0.40	PID	3ppm
											0.50		
		0.80	FILL / SAND, trace clay: dark grey; fine to coarse; with asphalt fragments.		FILL	ND	M		ES		0.90	PID	3ppm
	6	1									1.00		
		1.30	CLAY (CI-CH): brown; medium to high plasticity; slight sulfidic odour.		ALV		w=PL		ES		1.40	PID	3ppm
			1.70m: Pale grey mottled yellow-brown								1.50		
		2	Borehole discontinued at 2.00m depth. Target depth reached.						ES		1.90	PID	3ppm
	5										2.00		

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: Geoprobe with 150 mm solid flight auger
METHOD: Solid flight auger to 2 m
REMARKS:

OPERATOR: Terratest

LOGGED: JBC
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Western Sydney University
PROJECT: Indigenous Centre of Excellence
LOCATION: 171 Victoria Road, Rydalmere, NSW 2116

SURFACE LEVEL: 7.6 AHD
COORDINATE: E:317366.4, N:6257175.6
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: BH21
PROJECT No: 227190.01
DATE: 24/03/24
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
24/03/24 No free groundwater observed whilst drilling	7	0.03	ASPHALT (25 mm)			NA	NA						
			FILL / Gravelly SAND: dark grey; fine to coarse; fine to coarse, igneous gravel; trace asphalt fragments.		FILL				ES		0.10 0.20	PID	3ppm
		0.30	FILL / Silty SAND, trace gravel: pale grey and brown; fine to medium; sandstone gravel.		FILL		M		ES		0.30 0.40	PID	4ppm
		0.70	FILL / Silty CLAY, trace sand, trace gravel: brown; medium plasticity; siltstone gravel.		FILL	ND							
	6	1.20	CLAY (CI-CH), trace gravel: grey mottled yellow-brown; low to medium plasticity; fine to medium, siltstone gravel; trace rootlets.		ALV		w=PL		ES		1.20 1.30	PID	4ppm
	5	2	Borehole discontinued at 2.00m depth. Target depth reached.										

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: Geoprobe with 150 mm solid flight auger
METHOD: Solid flight auger to 2 m
REMARKS:

OPERATOR: Terratest

LOGGED: JBC
CASING: Nil

Refer to explanatory notes for symbol and abbreviation definitions

Generated with CORE-GS by Geroc - Soil Log

Terminology, Symbols and Abbreviations

November 2023

Introduction to Terminology, Symbols and Abbreviations

Douglas Partners' reports, investigation logs, and other correspondence may use terminology which has quantitative or qualitative connotations. To remove ambiguity or uncertainty surrounding the use of such terms, the following sets of notes pages may be attached Douglas Partners' reports, depending on the work performed and conditions encountered:

- Soil Descriptions;
- Rock Descriptions; and
- Sampling, insitu testing, and drilling methodologies

In addition to these pages, the following notes generally apply to most documents.

Abbreviation Codes

Site conditions may also be presented in a number of different formats, such as investigation logs, field mapping, or as a written summary. In some of these formats textual or symbolic terminology may be presented using textual abbreviation codes or graphic symbols, and, where commonly used, these are listed alongside the terminology definition. For ease of identification in these note pages, textual codes are presented in these notes in the following style XW. Code usage conforms with the following guidelines:

- Textual codes are case insensitive, although herein they are generally presented in upper case; and
- Textual codes are contextual (i.e. the same or similar combinations of characters may be used in different contexts with different meanings (for example `PL` is used for plastic limit in the context of soil moisture condition, as well as in `PL(A)` for point load test result in the testing results column)).

Data Integrity Codes

Subsurface investigation data recorded by Douglas Partners is generally managed in a highly structured database environment, where records "span" between a top and bottom depth interval. Depth interval "gaps" between records are considered to introduce ambiguity, and, where appropriate, our practice guidelines may require contiguous data sets. Recording meaningful data is not always appropriate (for example assigning a "strength" to a concrete pavement) and the following codes may be used to maintain contiguity in such circumstances.

Term	Description	Abbreviation Code
Core loss	No core recovery	KL
Unknown	Information was not available to allow classification of the property. For example, when auguring in loose, saturated sand auger cuttings may not be returned.	UK
No data	Information required to allow classification of the property was not available. For example if drilling is commenced from the base of a hole predrilled by others	ND
Not Applicable	Derivation of the properties not appropriate or beyond the scope of the investigation. For example providing a description of the strength of a concrete pavement	NA

Graphic Symbols

Douglas Partners' logs contain a "graphic" column which provides a pictorial representation of the basic composition of the material. The symbols used are directly representing the material name stated in the adjacent "Description of Strata" column, and as such no specific graphic symbology legend has been provided in these notes.

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Soil Descriptions

Terminology
Symbols
Abbreviations

March 2024

Introduction

All materials which are not considered to be "in-situ rock" are described in general accordance with the soil description model of AS 1726-2017 Part 6.1.3, and can be broken down into the following description structure:

The "classification" comprises a two character "group symbol" providing a general summary of dominant soil characteristics. The "name" summarises the particle sizes within the soil which most influence its behaviour. The detailed description presents more information about composition, condition, structure, and origin of the soil.

Classification, naming and description of soils require the relative proportion of particles of different sizes within the whole soil mixture to be considered.

Particle size designation and Behaviour Model

Solid particles within a soil are differentiated on the basis of size.

The engineering behaviour properties of a soil can subsequently be modelled to be either "fine grained" (also known as "cohesive" behaviour) or "coarse grained" ("non cohesive" behaviour), depending on the relative proportion of fine or coarse fractions in the soil mixture.

Particle Size Designation	Particle Size (mm)	Behaviour Model	
		Behaviour	Approximate Dry Mass
Boulder	>200	Excluded from particle behaviour model as "oversize"	
Cobble	63 - 200		
Gravel[1]	2.36 - 63	Coarse	>65%
Sand[1]	0.075 - 2.36		
Silt	0.002 - 0.075	Fine	>35%
Clay	<0.002		

[1] – refer grain size subdivision descriptions below

The behaviour model boundaries defined above are not precise, and the material behaviour should be assumed from the name given to the material (which considers the particle fraction which dominates the behaviour, refer "component proportions" below), rather than strict observance of the proportions of particle sizes. For example, if a material is named a "Sandy CLAY", this is indicative that the material exhibits fine grained behaviour, even if the dry mass of coarse grained material may exceed 65%.

Component proportions

The relative proportion of the dry mass of each particle size fraction is assessed to be a "primary", "secondary", or "minor" component of the soil mixture, depending on its influence over the soil behaviour.

Component Proportion Designation	Definition[1]	Relative Proportion	
		In Fine Grained Soil	In Coarse Grained Soil
Primary	The component (particle size designation, refer above) which dominates the engineering behaviour of the soil	The clay/silt component with the greater proportion	The sand/gravel component with the greater proportion
Secondary	Any component which is not the primary, but is significant to the engineering properties of the soil	Any component with greater than 30% proportion	Any granular component with greater than 30%; or Any fine component with greater than 12%
Minor[2]	Present in the soil, but not significant to its engineering properties	All other components	All other components

[1] As defined in AS1726-2017 6.1.4.4

[2] In the detailed material description, minor components are split into two further sub-categories. Refer "identification of minor components" below.

Composite Materials

In certain situations, a lithology description may describe more than one material, for example, collectively describing a layer of interbedded sand and clay. In such a scenario, the two materials would be described independently, with the names preceded or followed by a statement describing the arrangement by which the materials co-exist. For example, "INTERBEDDED Silty CLAY AND SAND".

Soil Descriptions

Classification

The soil classification comprises a two character group symbol. The first character identifies the primary component. The second character identifies either the grading or presence of fines in a coarse grained soil, or the plasticity in a fine grained soil. Refer AS1726-2017 6.1.6 for further clarification.

Soil Name

For most soils, the name is derived with the primary component included as the noun (in upper case), preceded by any secondary components stated in an adjective form. In this way, the soil name also describes the general composition and indicates the dominant behaviour of the material.

Component [1]	Prominence in Soil Name
Primary	Noun (eg "CLAY")
Secondary	Adjective modifier (eg "Sandy")
Minor	No influence

[1] – for determination of component proportions, refer component proportions on previous page

For materials which cannot be disaggregated, or which are not comprised of rock or mineral fragments, the names "ORGANIC MATTER" or "ARTIFICIAL MATERIAL" may be used, in accordance with AS1726-2017 Table 14.

Commercial or colloquial names are not used for the soil name where a component derived name is possible (for example "Gravelly SAND" rather than "CRACKER DUST").

Materials of "fill" or "topsoil" origin are generally assigned a name derived from the primary/secondary component (where appropriate). In log descriptions this is preceded by uppercase "FILL" or "TOPSOIL". Origin uncertainty is indicated in the description by the characters (?), with the degree of uncertainty described (using the terms "probably" or "possibly" in the origin column, or at the end of the description).

Identification of minor components

Minor components are identified in the soil description immediately following the soil name. The minor component fraction is usually preceded with a term indicating the relative proportion of the component.

Minor Component Proportion Term	Relative Proportion	
	In Fine Grained Soil	In Coarse Grained Soil
With	All fractions: 15-30%	Clay/silt: 5-12% sand/gravel: 15-30%
Trace	All fractions: 0-15%	Clay/silt: 0-5% sand/gravel: 0-15%

The terms "with" and "trace" generally apply only to gravel or fine particle fractions. Where cobbles/boulders are encountered in minor proportions (generally less than about 12%) the term "occasional" may be used. This term describes the sporadic distribution of the material within the confines of the investigation excavation only, and there may be considerable variation in proportion over a wider area which is difficult to factually characterise due to the relative size of the particles and the investigation methods.

Soil Composition

Plasticity

Descriptive Term	Laboratory liquid limit range	
	Silt	Clay
Non-plastic materials	Not applicable	Not applicable
Low plasticity	≤50	≤35
Medium plasticity	Not applicable	>35 and ≤50
High plasticity	>50	>50

Note, Plasticity descriptions generally describe the plasticity behaviour of the whole of the fine grained soil, not individual fine grained fractions.

Grain Size

Type		Particle size (mm)
Gravel	Coarse	19 - 63
	Medium	6.7 - 19
	Fine	2.36 – 6.7
Sand	Coarse	0.6 - 2.36
	Medium	0.21 - 0.6
	Fine	0.075 - 0.21

Grading

Grading Term	Particle size (mm)
Well	A good representation of all particle sizes
Poorly	An excess or deficiency of particular sizes within the specified range
Uniformly	Essentially of one size
Gap	A deficiency of a particular size or size range within the total range

Note, AS1726-2017 provides terminology for additional attributes not listed here.

Soil Condition

Moisture

The moisture condition of soils is assessed relative to the plastic limit for fine grained soils, while for coarse grained soils it is assessed based on the appearance and feel of the material. The moisture condition of a material is considered to be independent of stratigraphy (although commonly these are related), and this data is presented in its own column on logs.

Applicability	Term	Tactile Assessment	Abbreviation code
Fine	Dry of plastic limit	Hard and friable or powdery	w<PL
	Near plastic limit	Can be moulded	w=PL
	Wet of plastic limit	Water residue remains on hands when handling	w>PL
	Near liquid limit	"oozes" when agitated	w=LL
	Wet of liquid limit	"oozes"	w>LL
Coarse	Dry	Non-cohesive and free running	D
	Moist	Feels cool, darkened in colour, particles may stick together	M
	Wet	Feels cool, darkened in colour, particles may stick together, free water forms when handling	W

The abbreviation code NDF, meaning "not-assessable due to drilling fluid use" may also be used.

Note, observations relating to free ground water or drilling fluids are provided independent of soil moisture condition.

Consistency/Density/Compaction/Cementation/Extremely Weathered Material

These concepts give an indication of how the material may respond to applied forces (when considered in conjunction with other attributes of the soil). This behaviour can vary independent of the composition of the material, and on logs these are described in an independent column and are generally mutually exclusive (i.e it is inappropriate to describe both consistency and compaction at the same time). The method by which the behaviour is described depends on the behaviour model and other characteristics of the soil as follows:

- In fine grained soils, the "consistency" describes the ease with which the soil can be remoulded, and is generally correlated against the materials undrained shear strength;
- In granular materials, the relative density describes how tightly packed the particles are, and is generally correlated against the density index;
- In anthropogenically modified materials, the compaction of the material is described qualitatively;
- In cemented soils (both natural and anthropogenic), the cemented "strength" is described qualitatively, relative to the difficulty with which the material is disaggregated; and
- In soils of extremely weathered material origin, the engineering behaviour may be governed by relic rock features, and expected behaviour needs to be assessed based the overall material description.

Quantitative engineering performance of these materials may be determined by laboratory testing or estimated by correlated field tests (for example penetration or shear vane testing). In some cases, performance may be assessed by tactile or other subjective methods, in which case investigation logs will show the estimated value enclosed in round brackets, for example (VS).

Consistency (fine grained soils)

Consistency Term	Tactile Assessment	Undrained Shear Strength (kPa)	Abbreviation Code
Very soft	Extrudes between fingers when squeezed	<12	VS
Soft	Mouldable with light finger pressure	>12 - ≤25	S
Firm	Mouldable with strong finger pressure	>25 - ≤50	F
Stiff	Cannot be moulded by fingers	>50 - ≤100	St
Very stiff	Indented by thumbnail	>100 - ≤200	VSt
Hard	Indented by thumbnail with difficulty	>200	H
Friable	Easily crumbled or broken into small pieces by hand	-	Fr

Relative Density (coarse grained soils)

Relative Density Term	Density Index	Abbreviation Code
Very loose	<15	VL
Loose	>15 - ≤35	L
Medium dense	>35 - ≤65	MD
Dense	>65 - ≤85	D
Very dense	>85	VD

Note, tactile assessment of relative density is difficult, and generally requires penetration testing, hence a tactile assessment guide is not provided.

Compaction (anthropogenically modified soil)

Compaction Term	Abbreviation Code
Well compacted	WC
Poorly compacted	PC
Moderately compacted	MC
Variably compacted	VC

Cementation (natural and anthropogenic)

Cementation Term	Abbreviation Code
Moderately cemented	MOD
Weakly cemented	WEK

Extremely Weathered Material

AS1726-2017 considers weathered material to be soil if the unconfined compressive strength is less than 0.6 MPa (i.e. less than very low strength rock). These materials may be identified as "extremely weathered material" in reports and by the abbreviation code XWM on log sheets. This identification is not correlated to any specific qualitative or quantitative behaviour, and the engineering properties of this material must therefore be assessed according to engineering principles with reference to any relic rock structure, fabric, or texture described in the description.

Soil Origin

Term	Description	Abbreviation Code
Residual	Derived from in-situ weathering of the underlying rock	RS
Extremely weathered material	Formed from in-situ weathering of geological formations. Has strength of less than 'very low' as per as1726 but retains the structure or fabric of the parent rock.	XWM
Alluvial	Deposited by streams and rivers	ALV
Fluvial	Deposited by channel fill and overbank (natural levee, crevasse splay or flood basin)	FLV
Estuarine	Deposited in coastal estuaries	EST
Marine	Deposited in a marine environment	MAR
Lacustrine	Deposited in freshwater lakes	LAC
Aeolian	Carried and deposited by wind	AEO
Colluvial	Soil and rock debris transported down slopes by gravity	COL
Slopewash	Thin layers of soil and rock debris gradually and slowly deposited by gravity and possibly water	SW
Topsoil	Mantle of surface soil, often with high levels of organic material	TOP
Fill	Any material which has been moved by man	FILL
Littoral	Deposited on the lake or seashore	LIT
Unidentifiable	Not able to be identified	UID

Cobbles and Boulders

The presence of particles considered to be "oversize" may be described using one of the following strategies:

- Oversize encountered in a minor proportion (when considered relative to the wider area) are noted in the soil description; or
- Where a significant proportion of oversize is encountered, the cobbles/boulders are described independent of the soil description, in a similar manner to composite soils (described above) but qualified with "MIXTURE OF".

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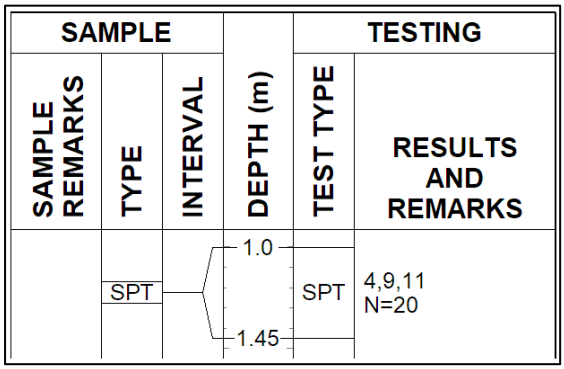
Sampling, Testing and Excavation Methodology

Terminology
Symbols
Abbreviations

March 2024

Sampling and Testing

A record of samples retained, and field testing performed is usually shown on a Douglas Partners' log with samples appearing to the left of a depth scale, and selected field and laboratory testing (including results, where relevant) appearing to the right of the scale, as illustrated below:



Sampling

The type or intended purpose for which a sample was taken is indicated by the following abbreviation codes.

Sample Type	Code
Auger sample	A
Acid Sulfate sample	ASS
Bulk sample	B
Core sample	C
Disturbed sample	D
Environmental sample	ES
Gas sample	G
Piston sample	P
Sample from SPT test	SPT
Undisturbed tube sample	U[1]
Water sample	W
Material Sample	MT
Core sample for unconfined compressive strength testing	UCS

[1] – numeric suffixes indicate tube diameter/width in mm

The above codes only indicate that a sample was retained, and not that testing was scheduled or performed.

Field and Laboratory Testing

A record that field and laboratory testing was performed is indicated by the following abbreviation codes.

Test Type	Code
Pocket penetrometer (kPa)	PP
Photo ionisation detector (ppm)	PID
Standard Penetration Test x/y =x blows for y mm penetration HB = hammer bouncing HW = fell under weight of hammer	SPT
Shear vane (kPa)	V
Unconfined compressive strength, (MPa)	UCS

Field and laboratory testing (continued)

Test Type	Code
Point load test, (MPa), axial (A), diametric (D), irregular (I)	PLT(_)
Dynamic cone penetrometer, followed by blow count penetration increment in mm (cone tip, generally in accordance with AS1289.6.3.2)	DCP/150
Perth sand penetrometer, followed by blow count penetration increment in mm (flat tip, generally in accordance with AS1289.6.3.3)	PSP/150

Groundwater Observations

▷	seepage/inflow
▽	standing or observed water level
NFGWO	no free groundwater observed
OBS	observations obscured by drilling fluids

Drilling or Excavation Methods/Tools

The drilling/excavation methods used to perform the investigation may be shown either in a dedicated column down the left-hand edge of the log, or stated in the log footer. In some circumstances abbreviation codes may be used.

Method	Abbreviation Code
Direct Push	DP
Solid flight auger. Suffixes: /T = tungsten carbide tip, /V = v-shaped tip	AD[1]
Air Track	AT
Diatube	DT[1]
Hand auger	HA[1]
Hand tools (unspecified)	HAND
Existing exposure	X
Hollow flight auger	HSA[1]
HQ coring	HQ3
HMLC series coring	HMLC
NMLC series coring	NMLC
NQ coring	NQ3
PQ coring	PQ3
Predrilled	PD
Push tube	PT[1]
Ripping tyne/ripper	R
Rock roller	RR[1]
Rock breaker/hydraulic hammer	EH
Sonic drilling	SON[1]
Mud/blade bucket	MB[1]
Toothed bucket	TB[1]
Vibrocore	VC[1]
Vacuum excavation	VE
Wash bore (unspecified bit type)	WB[1]

[1] – numeric suffixes indicate tool diameter/width in mm

Douglas PARTNERS

Appendix I

Laboratory Documentation

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CERTIFICATE OF ANALYSIS 345606

Client Details

Client	Douglas Partners Pty Ltd
Attention	Joel James-Hall
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**227190.01, Rydalmere**
Number of Samples	4 Soil
Date samples received	05/03/2024
Date completed instructions received	05/03/2024

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	12/03/2024
Date of Issue	12/03/2024

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

Asbestos Approved By
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Authorised by Asbestos Approved Signatory: Lucy Zhu

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Loren Bardwell, Development Chemist
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Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		345606-1	345606-3
Your Reference	UNITS	BH1	BH1
Depth		0.1-0.2	1-1.1
Date Sampled		01/03/2024	01/03/2024
Type of sample		Soil	Soil
Date extracted	-	06/03/2024	06/03/2024
Date analysed	-	08/03/2024	08/03/2024
TRH C_6 - C_9	mg/kg	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
Naphthalene	mg/kg	<1	<1
Total +ve Xylenes	mg/kg	<1	<1
Surrogate aaa-Trifluorotoluene	%	100	96

svTRH (C10-C40) in Soil			
Our Reference		345606-1	345606-3
Your Reference	UNITS	BH1	BH1
Depth		0.1-0.2	1-1.1
Date Sampled		01/03/2024	01/03/2024
Type of sample		Soil	Soil
Date extracted	-	06/03/2024	06/03/2024
Date analysed	-	08/03/2024	08/03/2024
TRH C_{10} - C_{14}	mg/kg	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50
TRH >C_{10} -C_{16} less Naphthalene (F2)	mg/kg	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50
Surrogate o-Terphenyl	%	86	101

PAHs in Soil			
Our Reference		345606-1	345606-3
Your Reference	UNITS	BH1	BH1
Depth		0.1-0.2	1-1.1
Date Sampled		01/03/2024	01/03/2024
Type of sample		Soil	Soil
Date extracted	-	06/03/2024	06/03/2024
Date analysed	-	08/03/2024	08/03/2024
Naphthalene	mg/kg	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1
Fluoranthene	mg/kg	0.1	0.1
Pyrene	mg/kg	0.1	0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1
Total +ve PAH's	mg/kg	0.2	0.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	111	108

Organochlorine Pesticides in soil		
Our Reference		345606-1
Your Reference	UNITS	BH1
Depth		0.1-0.2
Date Sampled		01/03/2024
Type of sample		Soil
Date extracted	-	06/03/2024
Date analysed	-	09/03/2024
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Mirex	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate 4-Chloro-3-NBTF	%	100

Organophosphorus Pesticides in Soil		
Our Reference		345606-1
Your Reference	UNITS	BH1
Depth		0.1-0.2
Date Sampled		01/03/2024
Type of sample		Soil
Date extracted	-	06/03/2024
Date analysed	-	09/03/2024
Dichlorvos	mg/kg	<0.1
Mevinphos	mg/kg	<0.1
Phorate	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Disulfoton	mg/kg	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1
Parathion-Methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Fenthion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Methidathion	mg/kg	<0.1
Fenamiphos	mg/kg	<0.1
Ethion	mg/kg	<0.1
Phosalone	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Coumaphos	mg/kg	<0.1
Surrogate 4-Chloro-3-NBTF	%	100

PCBs in Soil		
Our Reference		345606-1
Your Reference	UNITS	BH1
Depth		0.1-0.2
Date Sampled		01/03/2024
Type of sample		Soil
Date extracted	-	06/03/2024
Date analysed	-	09/03/2024
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate 2-Fluorobiphenyl	%	104

Acid Extractable metals in soil			
Our Reference		345606-1	345606-3
Your Reference	UNITS	BH1	BH1
Depth		0.1-0.2	1-1.1
Date Sampled		01/03/2024	01/03/2024
Type of sample		Soil	Soil
Date prepared	-	12/03/2024	12/03/2024
Date analysed	-	12/03/2024	12/03/2024
Arsenic	mg/kg	<4	5
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	14	16
Copper	mg/kg	60	13
Lead	mg/kg	9	17
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	30	11
Zinc	mg/kg	35	31

Misc Soil - Inorg		
Our Reference		345606-1
Your Reference	UNITS	BH1
Depth		0.1-0.2
Date Sampled		01/03/2024
Type of sample		Soil
Date prepared	-	06/03/2024
Date analysed	-	06/03/2024
Total Phenolics (as Phenol)	mg/kg	<5

Misc Inorg - Soil		
Our Reference		345606-3
Your Reference	UNITS	BH1
Depth		1-1.1
Date Sampled		01/03/2024
Type of sample		Soil
Date prepared	-	07/03/2024
Date analysed	-	07/03/2024
pH 1:5 soil:water	pH Units	8.8

CEC		
Our Reference		345606-3
Your Reference	UNITS	BH1
Depth		1-1.1
Date Sampled		01/03/2024
Type of sample		Soil
Date prepared	-	08/03/2024
Date analysed	-	08/03/2024
Exchangeable Ca	meq/100g	11
Exchangeable K	meq/100g	0.1
Exchangeable Mg	meq/100g	0.4
Exchangeable Na	meq/100g	0.1
Cation Exchange Capacity	meq/100g	12

Moisture			
Our Reference		345606-1	345606-3
Your Reference	UNITS	BH1	BH1
Depth		0.1-0.2	1-1.1
Date Sampled		01/03/2024	01/03/2024
Type of sample		Soil	Soil
Date prepared	-	06/03/2024	06/03/2024
Date analysed	-	07/03/2024	07/03/2024
Moisture	%	10	24

Asbestos ID - soils NEPM		
Our Reference		345606-1
Your Reference	UNITS	BH1
Depth		0.1-0.2
Date Sampled		01/03/2024
Type of sample		Soil
Date analysed	-	08/03/2024
Sample mass tested	g	1,136.83
Sample Description	-	Beige fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected
ACM >7mm Estimation*	g	–
FA and AF Estimation*	g	–
FA and AF Estimation*#2	%(w/w)	<0.001

PFAS in Soils Short		
Our Reference		345606-1
Your Reference	UNITS	BH1
Depth		0.1-0.2
Date Sampled		01/03/2024
Type of sample		Soil
Date prepared	-	06/03/2024
Date analysed	-	06/03/2024
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	0.2
Perfluorooctanoic acid PFOA	µg/kg	<0.1
6:2 FTS	µg/kg	<0.1
8:2 FTS	µg/kg	<0.2
Surrogate $^{13}C_8$ *PFOS*	%	96
Surrogate $^{13}C_2$ *PFOA*	%	99
Extracted ISTD $^{18}O_2$ *PFHxS*	%	88
Extracted ISTD $^{13}C_4$ *PFOS*	%	95
Extracted ISTD $^{13}C_4$ *PFOA*	%	102
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	100
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	100
Total Positive PFHxS & PFOS	µg/kg	0.2
Total Positive PFOS & PFOA	µg/kg	0.2
Total Positive PFAS	µg/kg	0.2

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. NOTE#1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF relative to the sample mass tested) NOTE#2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
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-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
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-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. 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-022/025	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.

Method ID	Methodology Summary
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.
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			06/03/2024	[NT]	[NT]	[NT]	[NT]	06/03/2024	[NT]
Date analysed	-			08/03/2024	[NT]	[NT]	[NT]	[NT]	08/03/2024	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	90	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	90	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	89	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	87	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	91	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	106	[NT]	[NT]	[NT]	[NT]	77	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			06/03/2024	[NT]	[NT]	[NT]	[NT]	06/03/2024	[NT]
Date analysed	-			08/03/2024	[NT]	[NT]	[NT]	[NT]	08/03/2024	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	117	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	107	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	117	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	107	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	114	[NT]
Surrogate o-Terphenyl	%		Org-020	88	[NT]	[NT]	[NT]	[NT]	90	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			06/03/2024	[NT]	[NT]	[NT]	[NT]	06/03/2024	[NT]
Date analysed	-			08/03/2024	[NT]	[NT]	[NT]	[NT]	08/03/2024	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	64	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	112	[NT]	[NT]	[NT]	[NT]	110	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			06/03/2024	[NT]	[NT]	[NT]	[NT]	06/03/2024	[NT]
Date analysed	-			08/03/2024	[NT]	[NT]	[NT]	[NT]	08/03/2024	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
HCB	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	128	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	124	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	122	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	122	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	104	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			06/03/2024	[NT]	[NT]	[NT]	[NT]	06/03/2024	[NT]
Date analysed	-			08/03/2024	[NT]	[NT]	[NT]	[NT]	08/03/2024	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Fenthion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	80	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Phosalone	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	104	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-9	[NT]
Date extracted	-			06/03/2024	[NT]	[NT]	[NT]	[NT]	06/03/2024	[NT]
Date analysed	-			08/03/2024	[NT]	[NT]	[NT]	[NT]	08/03/2024	[NT]
Aroclor 1016	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Aroclor 1260	mg/kg	0.1	Org-021/022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	111	[NT]	[NT]	[NT]	[NT]	99	[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	-			12/03/2024	[NT]	[NT]	[NT]	[NT]	12/03/2024	[NT]
Date analysed	-			12/03/2024	[NT]	[NT]	[NT]	[NT]	12/03/2024	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	116	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	74	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	108	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			06/03/2024	[NT]	[NT]	[NT]	[NT]	06/03/2024	[NT]
Date analysed	-			06/03/2024	[NT]	[NT]	[NT]	[NT]	06/03/2024	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			07/03/2024	[NT]	[NT]	[NT]	[NT]	07/03/2024	[NT]
Date analysed	-			07/03/2024	[NT]	[NT]	[NT]	[NT]	07/03/2024	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			08/03/2024	[NT]	[NT]	[NT]	[NT]	08/03/2024	[NT]
Date analysed	-			08/03/2024	[NT]	[NT]	[NT]	[NT]	08/03/2024	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	119	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	122	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]

QUALITY CONTROL: PFAS in Soils Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			06/03/2024	[NT]	[NT]	[NT]	[NT]	06/03/2024	[NT]
Date analysed	-			06/03/2024	[NT]	[NT]	[NT]	[NT]	06/03/2024	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
6:2 FTS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
8:2 FTS	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	113	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	96	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	96	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	114	[NT]	[NT]	[NT]	[NT]	112	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	103	[NT]	[NT]	[NT]	[NT]	110	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	105	[NT]	[NT]	[NT]	[NT]	108	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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

CoC: 5/3/24 1214

Douglas PARTNERS

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	227190.01	**Suburb:**	Rydalmere	**To:**	Envirolab Services
Project Manager:	Joel James-Hall	**Order Number:**	-	**Sampler:**	CC
					12 Ashley St, Chatswood NSW 2067
Email:	joel.james-hall@douglaspartners.com.au; henri.dubourdieu			**Attn:**	Sample Receipt
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day				(02) 9910 6200 samplereceipt@envirolab.com
Prior Storage:	☑ Fridge ☐ Freezer ☐ Esky ☐ Shelf	**Do samples contain 'potential' HBM?**	☐ No ☐ Yes (If YES, handle, transport, 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 M - Material	Container Type: G - glass P - plastic	Analytes: Combo 8AN	PFAS (short suite)	Combo 3	pH / CEC	Hold							Notes/ Preservation/ Additional Requirements
1	BH1	0.1	0.2	1/03/24	S	G/P	x	x										
2	BH1	0.5	0.6	1/03/24	S	G/P					x							
3	BH1	1	1.1	1/03/24	S	G/P			x	x								
4	BH1	1.5	1.6	1/03/24	S	G/P					x							

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

Job No: 345606
Date Received: 5/3/24
Time Received: 1330
Received By: DL
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Metals to analyse:	HM8 (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)		
Number of samples in container:	4	**Transported to laboratory by:**	Courier
Send results to:	Douglas Partners Pty Ltd		
Address:	96 Hermitage Road, West Ryde NSW 211	**Phone:**	(02) 9809 0666
Relinquished by:	HD	**Date:**	5/03/2024 **Signed:**

LAB RECEIPT

Lab Ref. No:	345606
Received by:	Da Hyun Lee
Date & Tim	5/3/24, 1330
Signed:	

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
Attention	Joel James-Hall

Sample Login Details

Your reference	227190.01, Rydalmere
Envirolab Reference	345606
Date Sample Received	05/03/2024
Date Instructions Received	05/03/2024
Date Results Expected to be Reported	12/03/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	4 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	PCBs in Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Misc Inorg - Soil	CEC	Asbestos ID - soils NEPM	PFAS in Soils Short	On Hold
BH1-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	
BH1-0.5-0.6													✓
BH1-1-1.1	✓	✓	✓				✓		✓	✓			
BH1-1.5-16													✓

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 346373

Client Details

Client	Douglas Partners Pty Ltd
Attention	Joel James-Hall
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**227190.01, Rydalmere**
Number of Samples	29 Soil
Date samples received	13/03/2024
Date completed instructions received	13/03/2024

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	20/03/2024
Date of Issue	20/03/2024

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

Results Approved By
Amanda Chui, LC/Air Toxics Supervisor
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Lucy Zhu, Asbestos Supervisor
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		346373-1	346373-2	346373-6	346373-11	346373-16
Your Reference	UNITS	BH2	BH2	BH3	BH4	BH5
Depth		0.1-0.2	0.5-0.6	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		09/03/2024	09/03/2024	10/03/2024	10/03/2024	10/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	90	73	95	87	79

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		346373-18	346373-22	346373-24	346373-26	346373-28
Your Reference	UNITS	BH5	BH6	BH6	BD1/20240309	Trip Spike
Depth		1-1.1	0.5-0.6	1.5-1.6	-	-
Date Sampled		10/03/2024	09/03/2024	09/03/2024	09/03/2024	09/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	[NA]
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	[NA]
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	106%
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	104%
Ethylbenzene	mg/kg	<1	<1	<1	<1	103%
m+p-xylene	mg/kg	<2	<2	<2	<2	103%
o-Xylene	mg/kg	<1	<1	<1	<1	102%
Naphthalene	mg/kg	<1	<1	<1	<1	[NA]
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	[NA]
Surrogate aaa-Trifluorotoluene	%	98	105	96	82	102

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		346373-29
Your Reference	UNITS	Trip Blank
Depth		-
Date Sampled		09/03/2024
Type of sample		Soil
Date extracted	-	15/03/2024
Date analysed	-	18/03/2024
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	89

svTRH (C10-C40) in Soil						
Our Reference		346373-1	346373-2	346373-6	346373-11	346373-16
Your Reference	UNITS	BH2	BH2	BH3	BH4	BH5
Depth		0.1-0.2	0.5-0.6	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		09/03/2024	09/03/2024	10/03/2024	10/03/2024	10/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	17/03/2024	17/03/2024	17/03/2024	17/03/2024	17/03/2024
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	230	170	110
TRH C_{29} - C_{36}	mg/kg	<100	<100	750	180	320
Total +ve TRH (C10-C36)	mg/kg	<50	<50	980	350	430
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	600	260	270
TRH >C_{34} -C_{40}	mg/kg	160	<100	1,600	290	640
Total +ve TRH (>C10-C40)	mg/kg	160	<50	2,200	550	910
Surrogate o-Terphenyl	%	83	86	90	94	85

svTRH (C10-C40) in Soil					
Our Reference		346373-18	346373-22	346373-24	346373-26
Your Reference	UNITS	BH5	BH6	BH6	BD1/20240309
Depth		1-1.1	0.5-0.6	1.5-1.6	-
Date Sampled		10/03/2024	09/03/2024	09/03/2024	09/03/2024
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	17/03/2024	17/03/2024	17/03/2024	17/03/2024
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50
TRH >C_{10} -C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	92	85	80	82

PAHs in Soil						
Our Reference		346373-1	346373-2	346373-6	346373-11	346373-16
Your Reference	UNITS	BH2	BH2	BH3	BH4	BH5
Depth		0.1-0.2	0.5-0.6	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		09/03/2024	09/03/2024	10/03/2024	10/03/2024	10/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	0.4	<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	2.4	0.2	<0.1
Anthracene	mg/kg	<0.1	<0.1	0.9	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	4.8	0.5	0.3
Pyrene	mg/kg	0.1	<0.1	4.6	0.5	0.2
Benzo(a)anthracene	mg/kg	<0.1	<0.1	2.4	0.2	<0.1
Chrysene	mg/kg	<0.1	<0.1	2.0	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	4.6	0.4	0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	3.2	0.3	0.1
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	1.8	0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	0.5	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	2.4	0.2	0.2
Total +ve PAH's	mg/kg	0.3	<0.05	30	2.6	1.0
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	4.6	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	4.6	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	4.6	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	104	109	100	101	102

PAHs in Soil					
Our Reference		346373-18	346373-22	346373-24	346373-26
Your Reference	UNITS	BH5	BH6	BH6	BD1/20240309
Depth		1-1.1	0.5-0.6	1.5-1.6	-
Date Sampled		10/03/2024	09/03/2024	09/03/2024	09/03/2024
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.2	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.6	<0.1	<0.1	<0.1
Anthracene	mg/kg	0.2	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	1.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	1.0	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.5	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.5	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	1	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.73	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.4	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	6.5	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	0.9	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	1	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.0	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	99	101	104	103

Organochlorine Pesticides in soil				
Our Reference		346373-1	346373-16	346373-22
Your Reference	UNITS	BH2	BH5	BH6
Depth		0.1-0.2	0.1-0.2	0.5-0.6
Date Sampled		09/03/2024	10/03/2024	09/03/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	15/03/2024	15/03/2024	15/03/2024
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Mirex	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	98	104	94

Organophosphorus Pesticides in Soil				
Our Reference		346373-1	346373-16	346373-22
Your Reference	UNITS	BH2	BH5	BH6
Depth		0.1-0.2	0.1-0.2	0.5-0.6
Date Sampled		09/03/2024	10/03/2024	09/03/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	15/03/2024	15/03/2024	15/03/2024
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1
Phorate	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Disulfoton	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1
Parathion-Methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Fenthion	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Methidathion	mg/kg	<0.1	<0.1	<0.1
Fenamiphos	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Phosalone	mg/kg	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Coumaphos	mg/kg	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	98	104	94

PCBs in Soil				
Our Reference		346373-1	346373-16	346373-22
Your Reference	UNITS	BH2	BH5	BH6
Depth		0.1-0.2	0.1-0.2	0.5-0.6
Date Sampled		09/03/2024	10/03/2024	09/03/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	15/03/2024	15/03/2024	15/03/2024
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate 2-Fluorobiphenyl	%	101	103	95

Acid Extractable metals in soil						
Our Reference		346373-1	346373-2	346373-6	346373-11	346373-16
Your Reference	UNITS	BH2	BH2	BH3	BH4	BH5
Depth		0.1-0.2	0.5-0.6	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		09/03/2024	09/03/2024	10/03/2024	10/03/2024	10/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	19/03/2024	19/03/2024	19/03/2024	19/03/2024	19/03/2024
Arsenic	mg/kg	<4	4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	18	15	18	24
Copper	mg/kg	62	5	110	47	52
Lead	mg/kg	3	12	3	16	21
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	61	5	7	32	90
Zinc	mg/kg	40	9	36	49	49

Acid Extractable metals in soil					
Our Reference		346373-18	346373-22	346373-24	346373-26
Your Reference	UNITS	BH5	BH6	BH6	BD1/20240309
Depth		1-1.1	0.5-0.6	1.5-1.6	-
Date Sampled		10/03/2024	09/03/2024	09/03/2024	09/03/2024
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	19/03/2024	19/03/2024	19/03/2024	19/03/2024
Arsenic	mg/kg	<4	<4	<4	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	9	14	10	19
Copper	mg/kg	4	61	31	5
Lead	mg/kg	27	1	<1	13
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	88	54	4
Zinc	mg/kg	16	44	25	9

Misc Soil - Inorg				
Our Reference		346373-1	346373-16	346373-22
Your Reference	UNITS	BH2	BH5	BH6
Depth		0.1-0.2	0.1-0.2	0.5-0.6
Date Sampled		09/03/2024	10/03/2024	09/03/2024
Type of sample		Soil	Soil	Soil
Date prepared	-	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	18/03/2024	18/03/2024	18/03/2024
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5

Misc Inorg - Soil			
Our Reference		346373-11	346373-18
Your Reference	UNITS	BH4	BH5
Depth		0.1-0.2	1-1.1
Date Sampled		10/03/2024	10/03/2024
Type of sample		Soil	Soil
Date prepared	-	13/03/2024	13/03/2024
Date analysed	-	18/03/2024	18/03/2024
pH 1:5 soil:water	pH Units	10.9	7.0

CEC			
Our Reference		346373-11	346373-18
Your Reference	UNITS	BH4	BH5
Depth		0.1-0.2	1-1.1
Date Sampled		10/03/2024	10/03/2024
Type of sample		Soil	Soil
Date prepared	-	19/03/2024	19/03/2024
Date analysed	-	19/03/2024	19/03/2024
Exchangeable Ca	meq/100g	95	6.9
Exchangeable K	meq/100g	1.4	0.2
Exchangeable Mg	meq/100g	0.5	2.4
Exchangeable Na	meq/100g	0.7	0.6
Cation Exchange Capacity	meq/100g	97	10

Moisture						
Our Reference		346373-1	346373-2	346373-6	346373-11	346373-16
Your Reference	UNITS	BH2	BH2	BH3	BH4	BH5
Depth		0.1-0.2	0.5-0.6	0.1-0.2	0.1-0.2	0.1-0.2
Date Sampled		09/03/2024	09/03/2024	10/03/2024	10/03/2024	10/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Moisture	%	11	19	8.6	20	5.6

Moisture					
Our Reference		346373-18	346373-22	346373-24	346373-26
Your Reference	UNITS	BH5	BH6	BH6	BD1/20240309
Depth		1-1.1	0.5-0.6	1.5-1.6	-
Date Sampled		10/03/2024	09/03/2024	09/03/2024	09/03/2024
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Date analysed	-	18/03/2024	18/03/2024	18/03/2024	18/03/2024
Moisture	%	12	8.3	13	21

Asbestos ID - soils NEPM					
Our Reference		346373-6	346373-11	346373-16	346373-22
Your Reference	UNITS	BH3	BH4	BH5	BH6
Depth		0.1-0.2	0.1-0.2	0.1-0.2	0.5-0.6
Date Sampled		10/03/2024	10/03/2024	10/03/2024	09/03/2024
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	15/03/2024	15/03/2024	15/03/2024	15/03/2024
Sample mass tested	g	1,003.05	808.47	1,003	726.3
Sample Description	-	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks	Grey coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–
FA and AF Estimation*	g	–	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils		
Our Reference		346373-1
Your Reference	UNITS	BH2
Depth		0.1-0.2
Date Sampled		09/03/2024
Type of sample		Soil
Date analysed	-	20/03/2024
Sample mass tested	g	Approx. 50g
Sample Description	-	Grey coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	NO
Trace Analysis	-	No asbestos detected

PFAS in Soils Short			
Our Reference		346373-11	346373-16
Your Reference	UNITS	BH4	BH5
Depth		0.1-0.2	0.1-0.2
Date Sampled		10/03/2024	10/03/2024
Type of sample		Soil	Soil
Date prepared	-	15/03/2024	15/03/2024
Date analysed	-	15/03/2024	15/03/2024
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	0.2	<0.1
Perfluorooctanoic acid PFOA	µg/kg	<0.1	<0.1
6:2 FTS	µg/kg	<0.1	<0.1
8:2 FTS	µg/kg	<0.2	<0.2
Surrogate $^{13}C_8$ *PFOS*	%	102	98
Surrogate $^{13}C_2$ *PFOA*	%	100	102
Extracted ISTD $^{18}O_2$ *PFHxS*	%	95	104
Extracted ISTD $^{13}C_4$ *PFOS*	%	95	102
Extracted ISTD $^{13}C_4$ *PFOA*	%	95	107
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	91	103
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	101	117
Total Positive PFHxS & PFOS	µg/kg	0.2	<0.1
Total Positive PFOS & PFOA	µg/kg	0.2	<0.1
Total Positive PFAS	µg/kg	0.2	<0.1

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. NOTE#1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF relative to the sample mass tested) NOTE#2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
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-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
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-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. 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-022/025	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.

Method ID	Methodology Summary
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.
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	346373-16
Date extracted	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Date analysed	-			18/03/2024	1	18/03/2024	18/03/2024		18/03/2024	18/03/2024
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	100	98
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	100	98
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	97	97
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	103	102
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	92	90
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	105	101
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	108	104
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	100	1	90	100	11	105	105

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	346373-16
Date extracted	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Date analysed	-			16/03/2024	1	17/03/2024	17/03/2024		17/03/2024	17/03/2024
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	114	116
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	116	114
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	129	#
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	114	116
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	110	10	116	114
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	160	180	12	129	#
Surrogate o-Terphenyl	%		Org-020	79	1	83	89	7	90	94

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	346373-16
Date extracted	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Date analysed	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	78
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	88	82
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	80
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	79
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	0.2	67	96	78
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.1	0.1	0	90	72
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	70	61
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	90	89
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	104	1	104	105	1	94	93

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	346373-16
Date extracted	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Date analysed	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	106	102
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	110	105
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	86	76
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	94	88
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	126	122
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	128	116
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	136	135
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	122	138
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	104	106
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	94	122
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	101	1	98	99	1	94	97

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	346373-16
Date extracted	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Date analysed	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	116	114
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[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]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion-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	78	78
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	96	118
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	124
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	83
Fenthion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	126
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<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	100	124
Phosalone	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	101	1	98	99	1	94	97

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	346373-16
Date extracted	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Date analysed	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Aroclor 1016	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	87	80
Aroclor 1260	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	100	1	101	101	0	94	95

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	346373-16
Date prepared	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Date analysed	-			19/03/2024	1	19/03/2024	19/03/2024		19/03/2024	19/03/2024
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	110	93
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	105	84
Chromium	mg/kg	1	Metals-020	<1	1	15	13	14	108	88
Copper	mg/kg	1	Metals-020	<1	1	62	51	19	105	#
Lead	mg/kg	1	Metals-020	<1	1	3	2	40	107	#
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	104	91
Nickel	mg/kg	1	Metals-020	<1	1	61	75	21	105	86
Zinc	mg/kg	1	Metals-020	<1	1	40	44	10	103	71

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			15/03/2024	1	15/03/2024	15/03/2024		15/03/2024	[NT]
Date analysed	-			18/03/2024	1	18/03/2024	18/03/2024		18/03/2024	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	98	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			13/03/2024	[NT]	[NT]	[NT]	[NT]	13/03/2024	[NT]
Date analysed	-			18/03/2024	[NT]	[NT]	[NT]	[NT]	18/03/2024	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	101	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			19/03/2024	[NT]	[NT]	[NT]	[NT]	19/03/2024	[NT]
Date analysed	-			19/03/2024	[NT]	[NT]	[NT]	[NT]	19/03/2024	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]

QUALITY CONTROL: PFAS in Soils Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	346373-16
Date prepared	-			15/03/2024	11	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Date analysed	-			15/03/2024	11	15/03/2024	15/03/2024		15/03/2024	15/03/2024
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	<0.1	11	<0.1	<0.1	0	95	94
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	<0.1	11	0.2	0.1	67	87	89
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	<0.1	11	<0.1	<0.1	0	100	97
6:2 FTS	µg/kg	0.1	Org-029	<0.1	11	<0.1	<0.1	0	103	96
8:2 FTS	µg/kg	0.2	Org-029	<0.2	11	<0.2	<0.2	0	101	84
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	100	11	102	94	8	93	99
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	100	11	100	98	2	101	97
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	104	11	95	97	2	108	101
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	105	11	95	101	6	111	101
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	107	11	95	97	2	106	105
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	105	11	91	92	1	111	110
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	110	11	101	106	5	102	116

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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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

TRH Soil C10-C40 NEPM - # Percent recovery for the matrix spike is not possible to report as the high concentration of analytes in sample 346373-16ms have caused interference.

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

8 metals in soil - # Percent recovery is not possible to report due to the inhomogeneous nature of the element/s in the sample/s. However an acceptable recovery was obtained for the LCS.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos according to ASB-001 asbestos subsampling procedure. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab/MPL recommends supplying 40-60g or 500ml of sample in its own container.
Note: Sample 346373-1 was sub-sampled from a jar provided by the client.

Douglas PARTNERS

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	227190.01	**Suburb:**	Rydalmere	**To:**	Envirolab Services
Project Manager:	Joel James-Hall	**Order Number:**	-	**Sampler:**	CC/JBC
					12 Ashley St, Chatswood NSW 2067
Email:	joel.james-hall@douglaspartners.com.au; henri.dubourdieu; huy.tran			**Attn:**	Sample Receipt
Turnaround time	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day				(02) 9910 6200 samplereceipt@envirolab.com
Prior Storage	☑ Fridge ☐ Freezer ☐ Esky ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No ☐ Yes (if YES, handle, transport, 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 M - Material	Container Type: G - glass P - plastic	Analytes: Combo 8AN	Combo 3AN	PFAS (short suite)	Combo 3	pH / CEC	TRH/BTEX	Hold					Notes/ Preservation/ Additional Requirements
1	BH2	0.1	0.2	9/3/24	S	G/P	x											
2	BH2	0.5	0.6	9/3/24	S	G/P				x								
3	BH2	1	1.1	9/3/24	S	G/P							x					
4	BH2	1.5	1.6	9/3/24	S	G/P							x					
5	BH2	2.5	2.6	9/3/24	S	G/P							x					
6	BH3	0.1	0.2	10/3/24	S	G/P		x										
7	BH3	0.5	0.6	10/3/24	S	G/P							x					
8	BH3	1	1.1	10/3/24	S	G/P							x					
9	BH3	1.5	1.6	10/3/24	S	G/P							x					
10	BH3	2	2.1	10/3/24	S	G/P							x					
11	BH4	0.1	0.2	10/3/24	S	G/P		x	x		x							
12	BH4	0.5	0.6	10/3/24	S	G/P							x					
13	BH4	1	1.1	10/3/24	S	G/P							x					
14	BH4	1.5	1.6	10/3/24	S	G/P							x					

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

Job No: 346373.
Date Received: 13/3/24
Time Received: 1520
Received By: CH
Temp: Cool/Ambient 15°c
Cooling: Ice/Icepack
Security: Intact/Broken/None

Metals to analyse:	HM8 (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)		
Number of samples in container:		**Transported to laboratory by:**	Courier
Send results to:	Douglas Partners Pty Ltd		
Address:	96 Hermitage Road, West Ryde NSW 211	**Phone:**	(02) 9809 0666
Relinquished by:	HD	**Date:**	13-03-24
		Signed:	

LAB RECEIPT

Lab Ref. No:	346373.
Received by:	Christine Ho
Date & Tim:	13/3/24 1520
Signed:	

Douglas PARTNERS

CHAIN OF CUSTODY DESPATCH SHEET

Project No: 227190.01	**Suburb:** Rydalmere	**To:** Envirolab Services	
Project Manager: Joel James-Hall		**Dispatch date:** 45364	

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water M -	Container Type: G - glass P - plastic	Analytes: Combo 8AN	Combo 3AN	PFAS (short suite)	Combo 3	pH / CEC	TRH/BTEX	Hold					Notes/ Preservation/ Additional Requirements
15	BH4	2	2.1	10/3/24	S	G/P							x					
16	BH5	0.1	0.2	10/3/24	S	G/P	x		x									
17	BH5	0.5	0.6	10/3/24	S	G/P							x					
18	BH5	1	1.1	10/3/24	S	G/P				x	x							
19	BH5	1.5	1.6	10/3/24	S	G/P							x					
20	BH5	2	2.1	10/3/24	S	G/P							x					
21	BH6	0.1	0.2	9/3/24	S	G/P							x					
22	BH6	0.5	0.6	9/3/24	S	G/P	x											
23	BH6	1	1.1	9/3/24	S	G/P							x					
24	BH6	1.5	1.6	9/3/24	S	G/P				x								
25	BH6	2	2.1	9/3/24	S	G/P							x					
26	BD1/20240309			9/3/24	S	G/P				x								
27	BD2/20240309			9/3/24	S	G/P							x					
28	Trip spike			9/3/24	S	G						x						
29	Trip blank			9/3/24	S	G						x						#346373 13/3/24 CH

Project No: 227190.01	**Suburb:** Rydalmere	**To:** Envirolab Services	
Project Manager: Joel James-Hall		**Dispatch date:** 45364	

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
Attention	Joel James-Hall

Sample Login Details

Your reference	227190.01, Rydalmere
Envirolab Reference	346373
Date Sample Received	13/03/2024
Date Instructions Received	13/03/2024
Date Results Expected to be Reported	20/03/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	29 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	15
Cooling Method	Ice Pack
Sampling Date Provided	YES

Comments

No asbestos bag given for sample #1-BH2/0.1-0.2- cannot conduct asbestos NEPM.
Sample #21-BH6/0.1-0.2 received broken in transit.

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
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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Misc Inorg - Soil	CEC	Asbestos ID - soils NEPM	Asbestos ID - soils	PFAS in Soils Short	On Hold
BH2-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓				✓		
BH2-0.5-0.6	✓	✓	✓				✓							
BH2-1-1.1														✓
BH2-1.5-1.6														✓
BH2-2.5-2.6														✓
BH3-0.1-0.2	✓	✓	✓				✓				✓			
BH3-0.5-0.6														✓
BH3-1-1.1														✓
BH3-1.5-1.6														✓
BH3-2-2.1														✓
BH4-0.1-0.2	✓	✓	✓				✓		✓	✓	✓		✓	
BH4-0.5-0.6														✓
BH4-1-1.1														✓
BH4-1.5-1.6														✓
BH4-2-2.1														✓
BH5-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓			✓		✓	
BH5-0.5-0.6														✓
BH5-1-1.1	✓	✓	✓				✓		✓	✓				
BH5-1.5-1.6														✓
BH5-2-2.1														✓
BH6-0.1-0.2														✓
BH6-0.5-0.6	✓	✓	✓	✓	✓	✓	✓	✓			✓			
BH6-1-1.1														✓
BH6-1.5-1.6	✓	✓	✓				✓							
BH6-2-2.1														✓
BD1/20240309	✓	✓	✓				✓							
BD2/20240309														✓
Trip Spike	✓													
Trip Blank	✓													

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

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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.

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CERTIFICATE OF ANALYSIS 346373-A

Client Details

Client	Douglas Partners Pty Ltd
Attention	Huy Tran
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**227190.01, Rydalmere**
Number of Samples	Additional TCLP analysis
Date samples received	13/03/2024
Date completed instructions received	21/03/2024

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	28/03/2024
Date of Issue	28/03/2024

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

Results Approved By
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor

Authorised By
Nancy Zhang, Laboratory Manager

TCLP Preparation - Acid				
Our Reference		346373-A-6	346373-A-16	346373-A-22
Your Reference	UNITS	BH3	BH5	BH6
Depth		0.1-0.2	0.1-0.2	0.5-0.6
Date Sampled		10/03/2024	10/03/2024	09/03/2024
Type of sample		Soil	Soil	Soil
pH of soil for fluid# determ.	pH units	9.6	9.4	10.4
pH of soil TCLP (after HCl)	pH units	1.7	1.7	1.7
Extraction fluid used		1	1	1
pH of final Leachate	pH units	5.0	5.0	5.3

PAHs in TCLP (USEPA 1311)		
Our Reference		346373-A-6
Your Reference	UNITS	BH3
Depth		0.1-0.2
Date Sampled		10/03/2024
Type of sample		Soil
Date extracted	-	22/03/2024
Date analysed	-	22/03/2024
Naphthalene in TCLP	mg/L	<0.0001
Acenaphthylene in TCLP	mg/L	<0.0001
Acenaphthene in TCLP	mg/L	<0.0001
Fluorene in TCLP	mg/L	<0.0001
Phenanthrene in TCLP	mg/L	0.0001
Anthracene in TCLP	mg/L	<0.0001
Fluoranthene in TCLP	mg/L	<0.0001
Pyrene in TCLP	mg/L	<0.0001
Benzo(a)anthracene in TCLP	mg/L	<0.0001
Chrysene in TCLP	mg/L	<0.0001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.0002
Benzo(a)pyrene in TCLP	mg/L	<0.0001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.0001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.0001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.0001
Total +ve PAH's	mg/L	0.0001
Surrogate p-Terphenyl-d14	%	94

Metals from Leaching Fluid pH 2.9 or 5			
Our Reference		346373-A-16	346373-A-22
Your Reference	UNITS	BH5	BH6
Depth		0.1-0.2	0.5-0.6
Date Sampled		10/03/2024	09/03/2024
Type of sample		Soil	Soil
Date extracted	-	25/03/2024	25/03/2024
Date analysed	-	25/03/2024	25/03/2024
Arsenic	mg/L	<0.05	<0.05
Cadmium	mg/L	<0.01	<0.01
Chromium	mg/L	<0.01	0.02
Copper	mg/L	0.07	0.04
Lead	mg/L	<0.03	<0.03
Mercury	mg/L	<0.0005	<0.0005
Nickel	mg/L	0.24	0.06
Zinc	mg/L	0.04	0.08

Method ID	Methodology Summary
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439. 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.
Metals-020	Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3. Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.
Metals-021	Determination of Mercury by Cold Vapour AAS following buffer determination as per USEPA 1311 and hence AS 4439.3. Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.
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-W3	[NT]
Date extracted	-			22/03/2024	[NT]	[NT]	[NT]	[NT]	22/03/2024	[NT]
Date analysed	-			22/03/2024	[NT]	[NT]	[NT]	[NT]	22/03/2024	[NT]
Naphthalene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	125	[NT]
Acenaphthylene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	98	[NT]
Fluorene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	118	[NT]
Phenanthrene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	111	[NT]
Anthracene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	100	[NT]
Pyrene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	106	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	84	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.0002	Org-022/025	<0.0002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	104	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	97	[NT]	[NT]	[NT]	[NT]	93	[NT]

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			25/03/2024	[NT]	[NT]	[NT]	[NT]	25/03/2024	[NT]
Date analysed	-			25/03/2024	[NT]	[NT]	[NT]	[NT]	25/03/2024	[NT]
Arsenic	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	114	[NT]
Cadmium	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	111	[NT]
Chromium	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	110	[NT]
Copper	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	110	[NT]
Lead	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	112	[NT]
Mercury	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	103	[NT]
Nickel	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	104	[NT]
Zinc	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	107	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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.

Anna Bui

From: Stuart Chen
Sent: Thursday, 21 March 2024 12:34 PM
To: Huy Tran; Joel James-Hall; Johann Chalache; Customer Service
Subject: RE: Results for Registration 346373 227190.01, Rydalmere

No problems Huy.

@Customer Service A-job please.

ELS REF: 346373-A
TAT: STANDARD
DUE: 28/3/24
AB.

Kind Regards,

Stuart Chen | Reporting Coordinator | Envirolab Services

Great Science. Great Service.

12 Ashley Street Chatswood NSW 2067
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Samples will be analysed per our T&C's.

From: Huy Tran <huy.tran@douglaspartners.com.au>
Sent: Thursday, March 21, 2024 12:18 PM
To: Stuart Chen <SChen2@envirolab.com.au>; Joel James-Hall <joel.james-hall@douglaspartners.com.au>; Johann Chalache <Johann.Chalache@douglaspartners.com.au>
Subject: RE: Results for Registration 346373 227190.01, Rydalmere

HI Stuart,

Can you please run TCLP for
(6/22 - Metals: BH5/0.1-0.2 and BH6/0.5-0.6
6 - Bap: BH3/0.1-0.2

Huy Tran | Occupational Hygienist

02 9809 0666 +61 439 175 056 Huy.Tran@douglaspartners.com.au

www.douglaspartners.com.au 96 Hermitage Road, West Ryde
NSW 2114 | Wallumedegal Country
PO Box 472, West Ryde, NSW 1685

Douglas PARTNERS | GROUNDED EXPERTISE

Click here to learn about our awards and achievements.

From: Stuart Chen <SChen2@envirolab.com.au>
Sent: Wednesday, March 20, 2024 5:13 PM
To: Henri Dubourdieu <henri.dubourdieu@douglaspartners.com.au>; Joel James-Hall <joel.james-

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
Attention	Huy Tran

Sample Login Details

Your reference	227190.01, Rydalmere
Envirolab Reference	346373-A
Date Sample Received	13/03/2024
Date Instructions Received	21/03/2024
Date Results Expected to be Reported	28/03/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	Additional TCLP analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	15
Cooling Method	Ice Pack
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:

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Sample ID	TCLP Preparation - Acid	PAHs in TCLP (USEPA 1311)	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Zinc	On Hold
BH2-0.1-0.2											✓
BH2-0.5-0.6											✓
BH2-1-1.1											✓
BH2-1.5-1.6											✓
BH2-2.5-2.6											✓
BH3-0.1-0.2	✓	✓									
BH3-0.5-0.6											✓
BH3-1-1.1											✓
BH3-1.5-1.6											✓
BH3-2-2.1											✓
BH4-0.1-0.2											✓
BH4-0.5-0.6											✓
BH4-1-1.1											✓
BH4-1.5-1.6											✓
BH4-2-2.1											✓
BH5-0.1-0.2	✓		✓	✓	✓	✓	✓	✓	✓	✓	
BH5-0.5-0.6											✓
BH5-1-1.1											✓
BH5-1.5-1.6											✓
BH5-2-2.1											✓
BH6-0.1-0.2											✓
BH6-0.5-0.6	✓		✓	✓	✓	✓	✓	✓	✓	✓	
BH6-1-1.1											✓
BH6-1.5-1.6											✓
BH6-2-2.1											✓
BD1/20240309											✓
BD2/20240309											✓
Trip Spike											✓
Trip Blank											✓

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

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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.

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CERTIFICATE OF ANALYSIS 347493

Client Details

Client	Douglas Partners Pty Ltd
Attention	Joel James-Hall
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**227190.01, Rydalmere**
Number of Samples	33 Soil
Date samples received	26/03/2024
Date completed instructions received	26/03/2024

Analysis Details

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

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

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

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

Report Details

Date results requested by	04/04/2024
Date of Issue	04/04/2024

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Asbestos Approved By
Analysed by Asbestos Approved Analyst: Stuart Chen
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Loren Bardwell, Development Chemist
Lucy Zhu, Asbestos Supervisor
Sean McAlary, Chemist (FAS)
Timothy Toll, Senior Chemist

Authorised By
Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		347493-1	347493-2	347493-4	347493-5	347493-6
Your Reference	UNITS	BH7	BH7	BH8	BH8	BH9
Depth		0.1-0.2	0.9-1	0.4-0.5	1.3-1.4	0.5-0.7
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	03/04/2024	03/04/2024	03/04/2024	03/04/2024	03/04/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	86	98	99	98	74

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		347493-8	347493-9	347493-10	347493-11	347493-13
Your Reference	UNITS	BH10	BH11	BH11	BH12	BH13
Depth		0.3-0.4	0.1-0.2	0.8-0.9	0.1-0.2	1-1.2
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	03/04/2024	03/04/2024	03/04/2024	03/04/2024	03/04/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	81	91	86	90	100

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		347493-15	347493-16	347493-17	347493-18	347493-19
Your Reference	UNITS	BH14	BH15	BH16	BH16	BH17
Depth		0.4-0.5	0.3-0.5	0.5-0.6	0.7-0.8	0.4-0.5
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	03/04/2024	03/04/2024	03/04/2024	03/04/2024	03/04/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	89	94	92	87	79

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		347493-20	347493-21	347493-22	347493-23	347493-24
Your Reference	UNITS	BH17	BH18	BH19	BH19	BH19
Depth		1.8-1.9	0.5-0.7	0.4-0.5	0.9-1	1.3-1.4
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	03/04/2024	03/04/2024	03/04/2024	03/04/2024	03/04/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	87	91	78	92	85

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		347493-26	347493-27	347493-29	347493-30	347493-31
Your Reference	UNITS	BH20	BH20	BH21	BD1/20240324	BD3/20240324
Depth		0.4-0.5	0.9-1	0.3-0.4	-	-
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	03/04/2024	03/04/2024	03/04/2024	03/04/2024	03/04/2024
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	99	87	84	92	92

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		347493-32	347493-33
Your Reference	UNITS	TS	TB
Depth		-	-
Date Sampled		24/03/2024	24/03/2024
Type of sample		Soil	Soil
Date extracted	-	27/03/2024	27/03/2024
Date analysed	-	03/04/2024	03/04/2024
TRH C_6 - C_9	mg/kg	[NA]	<25
TRH C_6 - C_{10}	mg/kg	[NA]	<25
vTRH C_6 - C_{10} less BTEX (F1)	mg/kg	[NA]	<25
Benzene	mg/kg	107%	<0.2
Toluene	mg/kg	107%	<0.5
Ethylbenzene	mg/kg	106%	<1
m+p-xylene	mg/kg	104%	<2
o-Xylene	mg/kg	105%	<1
Naphthalene	mg/kg	[NA]	<1
Total +ve Xylenes	mg/kg	[NA]	<1
Surrogate aaa-Trifluorotoluene	%	92	84

svTRH (C10-C40) in Soil						
Our Reference		347493-1	347493-2	347493-4	347493-5	347493-6
Your Reference	UNITS	BH7	BH7	BH8	BH8	BH9
Depth		0.1-0.2	0.9-1	0.4-0.5	1.3-1.4	0.5-0.7
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	29/03/2024	28/03/2024	29/03/2024	29/03/2024	29/03/2024
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	1,300	<100	<100
TRH C_{29} - C_{36}	mg/kg	140	<100	1,000	<100	<100
Total +ve TRH (C10-C36)	mg/kg	140	<50	2,300	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	66	<50	<50
TRH >C_{10} -C_{16} less Naphthalene (F2)	mg/kg	<50	<50	66	<50	<50
TRH >C_{16} -C_{34}	mg/kg	130	<100	2,000	<100	<100
TRH >C_{34} -C_{40}	mg/kg	240	<100	580	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	370	<50	2,700	<50	<50
Surrogate o-Terphenyl	%	92	90	113	90	87

svTRH (C10-C40) in Soil						
Our Reference		347493-8	347493-9	347493-10	347493-11	347493-13
Your Reference	UNITS	BH10	BH11	BH11	BH12	BH13
Depth		0.3-0.4	0.1-0.2	0.8-0.9	0.1-0.2	1-1.2
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	29/03/2024	29/03/2024	29/03/2024	29/03/2024	29/03/2024
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	210	<100	320	<100
Total +ve TRH (C10-C36)	mg/kg	<50	210	<50	320	<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	<100	130	<100	290	<100
TRH >C_{34} -C_{40}	mg/kg	<100	380	<100	510	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	520	<50	800	<50
Surrogate o-Terphenyl	%	88	83	89	92	87

svTRH (C10-C40) in Soil						
Our Reference		347493-15	347493-16	347493-17	347493-18	347493-19
Your Reference	UNITS	BH14	BH15	BH16	BH16	BH17
Depth		0.4-0.5	0.3-0.5	0.5-0.6	0.7-0.8	0.4-0.5
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	29/03/2024	29/03/2024	29/03/2024	29/03/2024	29/03/2024
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	480	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	550	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	1,000	<50	<50	<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	860	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	530	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	1,400	<50	<50	<50	<50
Surrogate o-Terphenyl	%	95	86	84	82	84

svTRH (C10-C40) in Soil						
Our Reference		347493-20	347493-21	347493-22	347493-23	347493-24
Your Reference	UNITS	BH17	BH18	BH19	BH19	BH19
Depth		1.8-1.9	0.5-0.7	0.4-0.5	0.9-1	1.3-1.4
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	29/03/2024	29/03/2024	29/03/2024	29/03/2024	29/03/2024
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
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<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	<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	%	89	84	83	85	88

svTRH (C10-C40) in Soil						
Our Reference		347493-26	347493-27	347493-29	347493-30	347493-31
Your Reference	UNITS	BH20	BH20	BH21	BD1/20240324	BD3/20240324
Depth		0.4-0.5	0.9-1	0.3-0.4	-	-
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	29/03/2024	29/03/2024	29/03/2024	29/03/2024	29/03/2024
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
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<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	<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	%	86	84	81	85	87

PAHs in Soil						
Our Reference		347493-1	347493-2	347493-4	347493-5	347493-6
Your Reference	UNITS	BH7	BH7	BH8	BH8	BH9
Depth		0.1-0.2	0.9-1	0.4-0.5	1.3-1.4	0.5-0.7
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	02/04/2024	02/04/2024	28/03/2024	02/04/2024	02/04/2024
Naphthalene	mg/kg	<0.1	<0.1	0.4	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	3.7	0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	0.4	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	0.5	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	7.1	0.2	0.1
Anthracene	mg/kg	<0.1	<0.1	4.0	0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	33	0.7	0.4
Pyrene	mg/kg	0.1	<0.1	39	0.8	0.5
Benzo(a)anthracene	mg/kg	<0.1	<0.1	26	0.5	0.6
Chrysene	mg/kg	<0.1	<0.1	15	0.3	0.4
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	31	0.7	0.9
Benzo(a)pyrene	mg/kg	0.06	<0.05	22	0.5	0.62
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	9.6	0.2	0.3
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	2.9	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	11	0.2	0.4
Total +ve PAH's	mg/kg	0.3	<0.05	210	4.4	4.3
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	32	0.6	0.8
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	32	0.7	0.9
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	32	0.7	0.9
Surrogate p-Terphenyl-d14	%	107	105	104	107	106

PAHs in Soil						
Our Reference		347493-8	347493-9	347493-10	347493-11	347493-13
Your Reference	UNITS	BH10	BH11	BH11	BH12	BH13
Depth		0.3-0.4	0.1-0.2	0.8-0.9	0.1-0.2	1-1.2
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	28/03/2024	02/04/2024	02/04/2024	02/04/2024	02/04/2024
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	0.2	0.2	<0.1	0.2	0.2
Pyrene	mg/kg	0.2	0.2	<0.1	0.3	0.2
Benzo(a)anthracene	mg/kg	<0.1	0.1	<0.1	0.2	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	0.09	0.1	<0.05	0.1	0.08
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	0.2	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.58	1.1	<0.05	1.1	0.51
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	94	104	105	106	102

PAHs in Soil						
Our Reference		347493-15	347493-16	347493-17	347493-18	347493-19
Your Reference	UNITS	BH14	BH15	BH16	BH16	BH17
Depth		0.4-0.5	0.3-0.5	0.5-0.6	0.7-0.8	0.4-0.5
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	28/03/2024	28/03/2024	03/04/2024	02/04/2024	02/04/2024
Naphthalene	mg/kg	0.4	0.3	<0.1	0.1	<0.1
Acenaphthylene	mg/kg	2.3	0.5	<0.1	0.3	<0.1
Acenaphthene	mg/kg	0.1	0.2	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.3	0.6	<0.1	0.2	<0.1
Phenanthrene	mg/kg	3.5	2.3	0.1	1.2	<0.1
Anthracene	mg/kg	1.9	0.5	<0.1	0.3	<0.1
Fluoranthene	mg/kg	7.5	2.4	0.4	1.1	0.1
Pyrene	mg/kg	9.4	2.5	0.4	1.1	0.1
Benzo(a)anthracene	mg/kg	7.8	1.1	0.2	0.8	<0.1
Chrysene	mg/kg	4.3	1.2	0.2	0.4	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	11	2.1	0.4	0.8	<0.2
Benzo(a)pyrene	mg/kg	7.8	1.5	0.2	0.52	0.06
Indeno(1,2,3-c,d)pyrene	mg/kg	3.4	0.7	<0.1	0.2	<0.1
Dibenzo(a,h)anthracene	mg/kg	1.4	0.2	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	4.1	0.9	0.1	0.3	<0.1
Total +ve PAH's	mg/kg	65	17	2.0	7.3	0.3
Benzo(a)pyrene TEQ calc (zero)	mg/kg	11	2.1	<0.5	0.7	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	11	2.1	<0.5	0.8	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	11	2.1	<0.5	0.8	<0.5
Surrogate p-Terphenyl-d14	%	103	94	83	103	103

PAHs in Soil						
Our Reference		347493-20	347493-21	347493-22	347493-23	347493-24
Your Reference	UNITS	BH17	BH18	BH19	BH19	BH19
Depth		1.8-1.9	0.5-0.7	0.4-0.5	0.9-1	1.3-1.4
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	02/04/2024	02/04/2024	02/04/2024	28/03/2024	02/04/2024
Naphthalene	mg/kg	<0.1	0.2	0.2	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	0.2	<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	0.3	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	0.9	3.5	0.4	<0.1
Anthracene	mg/kg	<0.1	0.3	1.0	0.1	<0.1
Fluoranthene	mg/kg	<0.1	1.3	4.3	0.6	<0.1
Pyrene	mg/kg	<0.1	1.4	4.2	0.6	<0.1
Benzo(a)anthracene	mg/kg	<0.1	1.0	2.9	0.2	<0.1
Chrysene	mg/kg	<0.1	0.6	1.4	0.2	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	1	3.0	0.5	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.85	2.0	0.3	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	0.4	0.8	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	0.5	1	0.2	<0.1
Total +ve PAH's	mg/kg	<0.05	9.1	25	3.2	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	1.1	2.7	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	1.2	2.8	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	1.2	2.8	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	103	101	102	95	99

PAHs in Soil						
Our Reference		347493-26	347493-27	347493-29	347493-30	347493-31
Your Reference	UNITS	BH20	BH20	BH21	BD1/20240324	BD3/20240324
Depth		0.4-0.5	0.9-1	0.3-0.4	-	-
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	28/03/2024	02/04/2024	28/03/2024	02/04/2024	02/04/2024
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	0.2	0.4	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.3	0.3	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.2	0.3	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	0.2	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.1	0.2	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.2	0.3	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.2	0.2	<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	1.4	1.9	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	90	97	97	100	101

Organochlorine Pesticides in soil						
Our Reference		347493-4	347493-8	347493-15	347493-16	347493-17
Your Reference	UNITS	BH8	BH10	BH14	BH15	BH16
Depth		0.4-0.5	0.3-0.4	0.4-0.5	0.3-0.5	0.5-0.6
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	28/03/2024	28/03/2024	28/03/2024	28/03/2024	03/04/2024
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
Mirex	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 4-Chloro-3-NBTF	%	89	92	93	92	90

Organochlorine Pesticides in soil				
Our Reference		347493-23	347493-26	347493-29
Your Reference	UNITS	BH19	BH20	BH21
Depth		0.9-1	0.4-0.5	0.3-0.4
Date Sampled		24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	28/03/2024	28/03/2024	28/03/2024
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Mirex	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	90	89	90

Organophosphorus Pesticides in Soil						
Our Reference		347493-4	347493-8	347493-15	347493-16	347493-17
Your Reference	UNITS	BH8	BH10	BH14	BH15	BH16
Depth		0.4-0.5	0.3-0.4	0.4-0.5	0.3-0.5	0.5-0.6
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	28/03/2024	28/03/2024	28/03/2024	28/03/2024	03/04/2024
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phorate	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
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion-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
Fenthion	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
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenamiphos	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
Phosalone	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
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	89	92	93	92	90

Organophosphorus Pesticides in Soil				
Our Reference		347493-23	347493-26	347493-29
Your Reference	UNITS	BH19	BH20	BH21
Depth		0.9-1	0.4-0.5	0.3-0.4
Date Sampled		24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	28/03/2024	28/03/2024	28/03/2024
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1
Phorate	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Disulfoton	mg/kg	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1
Parathion-Methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Fenthion	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Methidathion	mg/kg	<0.1	<0.1	<0.1
Fenamiphos	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Phosalone	mg/kg	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Coumaphos	mg/kg	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	90	89	90

PCBs in Soil						
Our Reference		347493-4	347493-8	347493-15	347493-16	347493-17
Your Reference	UNITS	BH8	BH10	BH14	BH15	BH16
Depth		0.4-0.5	0.3-0.4	0.4-0.5	0.3-0.5	0.5-0.6
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	28/03/2024	28/03/2024	28/03/2024	28/03/2024	03/04/2024
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 2-Fluorobiphenyl	%	96	91	97	94	78

PCBs in Soil				
Our Reference		347493-23	347493-26	347493-29
Your Reference	UNITS	BH19	BH20	BH21
Depth		0.9-1	0.4-0.5	0.3-0.4
Date Sampled		24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil
Date extracted	-	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	28/03/2024	28/03/2024	28/03/2024
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate 2-Fluorobiphenyl	%	89	91	90

Acid Extractable metals in soil						
Our Reference		347493-1	347493-2	347493-4	347493-5	347493-6
Your Reference	UNITS	BH7	BH7	BH8	BH8	BH9
Depth		0.1-0.2	0.9-1	0.4-0.5	1.3-1.4	0.5-0.7
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/03/2024	28/03/2024	28/03/2024	28/03/2024	28/03/2024
Date analysed	-	02/04/2024	02/04/2024	02/04/2024	02/04/2024	02/04/2024
Arsenic	mg/kg	<4	5	5	6	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	19	13	22	35
Copper	mg/kg	72	11	22	7	55
Lead	mg/kg	<1	21	19	19	30
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	0.3
Nickel	mg/kg	92	6	25	8	3
Zinc	mg/kg	34	7	23	9	93

Acid Extractable metals in soil						
Our Reference		347493-8	347493-9	347493-10	347493-11	347493-13
Your Reference	UNITS	BH10	BH11	BH11	BH12	BH13
Depth		0.3-0.4	0.1-0.2	0.8-0.9	0.1-0.2	1-1.2
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/03/2024	28/03/2024	28/03/2024	28/03/2024	28/03/2024
Date analysed	-	02/04/2024	02/04/2024	02/04/2024	02/04/2024	02/04/2024
Arsenic	mg/kg	<4	<4	<4	<4	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	21	14	18	11
Copper	mg/kg	2	73	11	62	4
Lead	mg/kg	16	<1	16	22	17
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	120	6	15	2
Zinc	mg/kg	4	49	6	58	9

Acid Extractable metals in soil						
Our Reference		347493-15	347493-16	347493-17	347493-18	347493-19
Your Reference	UNITS	BH14	BH15	BH16	BH16	BH17
Depth		0.4-0.5	0.3-0.5	0.5-0.6	0.7-0.8	0.4-0.5
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/03/2024	28/03/2024	28/03/2024	28/03/2024	28/03/2024
Date analysed	-	02/04/2024	02/04/2024	02/04/2024	02/04/2024	02/04/2024
Arsenic	mg/kg	<4	6	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	17	13	12	18
Copper	mg/kg	63	18	37	23	34
Lead	mg/kg	32	43	24	44	27
Mercury	mg/kg	<0.1	0.4	0.4	<0.1	<0.1
Nickel	mg/kg	60	5	59	9	50
Zinc	mg/kg	50	39	42	100	44

Acid Extractable metals in soil						
Our Reference		347493-20	347493-21	347493-22	347493-23	347493-24
Your Reference	UNITS	BH17	BH18	BH19	BH19	BH19
Depth		1.8-1.9	0.5-0.7	0.4-0.5	0.9-1	1.3-1.4
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/03/2024	28/03/2024	28/03/2024	28/03/2024	28/03/2024
Date analysed	-	02/04/2024	02/04/2024	02/04/2024	02/04/2024	02/04/2024
Arsenic	mg/kg	4	4	8	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	10	16	15	12	8
Copper	mg/kg	12	6	8	3	3
Lead	mg/kg	16	59	41	21	12
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	3	8	2	2
Zinc	mg/kg	7	39	41	20	7

Acid Extractable metals in soil						
Our Reference		347493-26	347493-27	347493-29	347493-30	347493-31
Your Reference	UNITS	BH20	BH20	BH21	BD1/20240324	BD3/20240324
Depth		0.4-0.5	0.9-1	0.3-0.4	-	-
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/03/2024	28/03/2024	28/03/2024	28/03/2024	28/03/2024
Date analysed	-	02/04/2024	02/04/2024	02/04/2024	02/04/2024	02/04/2024
Arsenic	mg/kg	<4	<4	<4	5	5
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	8	8	10	15
Copper	mg/kg	9	27	4	11	11
Lead	mg/kg	12	82	11	16	17
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	15	23	6	2	5
Zinc	mg/kg	16	170	14	7	6

Acid Extractable metals in soil			
Our Reference		347493-34	347493-35
Your Reference	UNITS	BH8 - [TRIPLICATE]	BH20 - [TRIPLICATE]
Depth		0.4-0.5	0.4-0.5
Date Sampled		24/03/2024	24/03/2024
Type of sample		Soil	Soil
Date prepared	-	28/03/2024	28/03/2024
Date analysed	-	02/04/2024	02/04/2024
Arsenic	mg/kg	<4	<4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	13	13
Copper	mg/kg	14	12
Lead	mg/kg	25	19
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	20	20
Zinc	mg/kg	26	26

Misc Soil - Inorg						
Our Reference		347493-4	347493-8	347493-15	347493-16	347493-17
Your Reference	UNITS	BH8	BH10	BH14	BH15	BH16
Depth		0.4-0.5	0.3-0.4	0.4-0.5	0.3-0.5	0.5-0.6
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg				
Our Reference		347493-23	347493-26	347493-29
Your Reference	UNITS	BH19	BH20	BH21
Depth		0.9-1	0.4-0.5	0.3-0.4
Date Sampled		24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil
Date prepared	-	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	27/03/2024	27/03/2024	27/03/2024
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5

Moisture						
Our Reference		347493-1	347493-2	347493-3	347493-4	347493-5
Your Reference	UNITS	BH7	BH7	BH8	BH8	BH8
Depth		0.1-0.2	0.9-1	0.3-0.4	0.4-0.5	1.3-1.4
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	28/03/2024	28/03/2024	28/03/2024	28/03/2024	28/03/2024
Moisture	%	3.3	27	9.0	14	25

Moisture						
Our Reference		347493-6	347493-7	347493-8	347493-9	347493-10
Your Reference	UNITS	BH9	BH10	BH10	BH11	BH11
Depth		0.5-0.7	0.1-0.2	0.3-0.4	0.1-0.2	0.8-0.9
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	28/03/2024	28/03/2024	28/03/2024	28/03/2024	28/03/2024
Moisture	%	2.5	12	15	14	21

Moisture						
Our Reference		347493-11	347493-12	347493-13	347493-14	347493-15
Your Reference	UNITS	BH12	BH13	BH13	BH14	BH14
Depth		0.1-0.2	0-0.2	1-1.2	0.1-0.2	0.4-0.5
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	28/03/2024	28/03/2024	28/03/2024	28/03/2024	28/03/2024
Moisture	%	9.7	1.7	6.8	2.9	6.2

Moisture						
Our Reference		347493-16	347493-17	347493-18	347493-19	347493-20
Your Reference	UNITS	BH15	BH16	BH16	BH17	BH17
Depth		0.3-0.5	0.5-0.6	0.7-0.8	0.4-0.5	1.8-1.9
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	28/03/2024	28/03/2024	28/03/2024	28/03/2024	28/03/2024
Moisture	%	17	8.6	4.6	9.5	22

Moisture						
Our Reference		347493-21	347493-22	347493-23	347493-24	347493-25
Your Reference	UNITS	BH18	BH19	BH19	BH19	BH20
Depth		0.5-0.7	0.4-0.5	0.9-1	1.3-1.4	0.1-0.2
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	28/03/2024	28/03/2024	28/03/2024	28/03/2024	28/03/2024
Moisture	%	12	10	11	19	7.7

Moisture						
Our Reference		347493-26	347493-27	347493-28	347493-29	347493-30
Your Reference	UNITS	BH20	BH20	BH21	BH21	BD1/20240324
Depth		0.4-0.5	0.9-1	0.1-0.2	0.3-0.4	-
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	27/03/2024	27/03/2024	27/03/2024	27/03/2024	27/03/2024
Date analysed	-	28/03/2024	28/03/2024	28/03/2024	28/03/2024	28/03/2024
Moisture	%	11	19	3.3	5.3	22

Moisture		
Our Reference		347493-31
Your Reference	UNITS	BD3/20240324
Depth		-
Date Sampled		24/03/2024
Type of sample		Soil
Date prepared	-	27/03/2024
Date analysed	-	28/03/2024
Moisture	%	24

Asbestos ID - soils						
Our Reference		347493-1	347493-2	347493-5	347493-6	347493-9
Your Reference	UNITS	BH7	BH7	BH8	BH9	BH11
Depth		0.1-0.2	0.9-1	1.3-1.4	0.5-0.7	0.1-0.2
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	04/04/2024	04/04/2024	04/04/2024	04/04/2024	04/04/2024
Sample mass tested	g	Approx. 110g	Approx. 80g	Approx. 120g	Approx. 115g	Approx. 95g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Grey 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

Asbestos ID - soils						
Our Reference		347493-10	347493-11	347493-13	347493-18	347493-20
Your Reference	UNITS	BH11	BH12	BH13	BH16	BH17
Depth		0.8-0.9	0.1-0.2	1-1.2	0.7-0.8	1.8-1.9
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	04/04/2024	04/04/2024	04/04/2024	04/04/2024	04/04/2024
Sample mass tested	g	Approx. 95g	Approx. 80g	Approx. 105g	Approx. 90g	Approx. 110g
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
Asbestos comments	-	NO	NO	NO	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils			
Our Reference		347493-21	347493-24
Your Reference	UNITS	BH18	BH19
Depth		0.5-0.7	1.3-1.4
Date Sampled		24/03/2024	24/03/2024
Type of sample		Soil	Soil
Date analysed	-	04/04/2024	04/04/2024
Sample mass tested	g	Approx. 115g	Approx. 120g
Sample Description	-	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
Asbestos comments	-	NO	NO
Trace Analysis	-	No asbestos detected	No asbestos detected

Asbestos ID - soils NEPM						
Our Reference		347493-4	347493-8	347493-15	347493-16	347493-17
Your Reference	UNITS	BH8	BH10	BH14	BH15	BH16
Depth		0.4-0.5	0.3-0.4	0.4-0.5	0.3-0.5	0.5-0.6
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	04/04/2024	04/04/2024	04/04/2024	04/04/2024	04/04/2024
Sample mass tested	g	606.04	633.79	828.43	612.62	901.35
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 (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM						
Our Reference		347493-19	347493-22	347493-23	347493-26	347493-29
Your Reference	UNITS	BH17	BH19	BH19	BH20	BH21
Depth		0.4-0.5	0.4-0.5	0.9-1	0.4-0.5	0.3-0.4
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	04/04/2024	04/04/2024	04/04/2024	04/04/2024	04/04/2024
Sample mass tested	g	767.55	661.49	654.04	642.47	626.47
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown fine-grained soil & rocks	Brown coarse-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

PFAS in Soils Short						
Our Reference		347493-3	347493-7	347493-11	347493-12	347493-14
Your Reference	UNITS	BH8	BH10	BH12	BH13	BH14
Depth		0.3-0.4	0.1-0.2	0.1-0.2	0-0.2	0.1-0.2
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	28/03/2024	28/03/2024	28/03/2024	28/03/2024	28/03/2024
Date analysed	-	28/03/2024	28/03/2024	28/03/2024	28/03/2024	28/03/2024
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	<0.1	0.2	<0.1	<0.1
Perfluorooctanoic acid PFOA	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
6:2 FTS	µg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
8:2 FTS	µg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Surrogate $^{13}C_8$ *PFOS*	%	110	109	108	108	114
Surrogate $^{13}C_2$ *PFOA*	%	100	103	100	102	98
Extracted ISTD $^{18}O_2$ *PFHxS*	%	103	105	99	107	107
Extracted ISTD $^{13}C_4$ *PFOS*	%	97	100	93	100	97
Extracted ISTD $^{13}C_4$ *PFOA*	%	110	117	101	116	120
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	114	143	107	125	138
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	105	157	129	146	138
Total Positive PFHxS & PFOS	µg/kg	0.1	<0.1	0.2	<0.1	<0.1
Total Positive PFOS & PFOA	µg/kg	0.1	<0.1	0.2	<0.1	<0.1
Total Positive PFAS	µg/kg	0.1	<0.1	0.2	<0.1	<0.1

PFAS in Soils Short				
Our Reference		347493-16	347493-25	347493-28
Your Reference	UNITS	BH15	BH20	BH21
Depth		0.3-0.5	0.1-0.2	0.1-0.2
Date Sampled		24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil
Date prepared	-	28/03/2024	28/03/2024	28/03/2024
Date analysed	-	28/03/2024	28/03/2024	28/03/2024
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	0.2	<0.1	<0.1
Perfluorooctanoic acid PFOA	µg/kg	<0.1	<0.1	<0.1
6:2 FTS	µg/kg	<0.1	<0.1	<0.1
8:2 FTS	µg/kg	<0.2	<0.2	<0.2
Surrogate $^{13}C_8$ *PFOS*	%	103	111	109
Surrogate $^{13}C_2$ *PFOA*	%	106	98	97
Extracted ISTD $^{18}O_2$ *PFHxS*	%	100	99	106
Extracted ISTD $^{13}C_4$ *PFOS*	%	95	93	97
Extracted ISTD $^{13}C_4$ *PFOA*	%	113	104	114
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	115	100	123
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	124	113	129
Total Positive PFHxS & PFOS	µg/kg	0.2	<0.1	<0.1
Total Positive PFOS & PFOA	µg/kg	0.2	<0.1	<0.1
Total Positive PFAS	µg/kg	0.2	<0.1	<0.1

Misc Inorg - Soil			
Our Reference		347493-15	347493-24
Your Reference	UNITS	BH14	BH19
Depth		0.4-0.5	1.3-1.4
Date Sampled		24/03/2024	24/03/2024
Type of sample		Soil	Soil
Date prepared	-	28/03/2024	28/03/2024
Date analysed	-	28/03/2024	28/03/2024
pH 1:5 soil:water	pH Units	9.2	6.7

CEC			
Our Reference		347493-15	347493-24
Your Reference	UNITS	BH14	BH19
Depth		0.4-0.5	1.3-1.4
Date Sampled		24/03/2024	24/03/2024
Type of sample		Soil	Soil
Date prepared	-	04/04/2024	04/04/2024
Date analysed	-	04/04/2024	04/04/2024
Exchangeable Ca	meq/100g	11	5.7
Exchangeable K	meq/100g	0.3	0.2
Exchangeable Mg	meq/100g	2.0	2.4
Exchangeable Na	meq/100g	1.0	0.6
Cation Exchange Capacity	meq/100g	15	8.9

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. NOTE#1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF relative to the sample mass tested) NOTE#2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-001	pH - Measured using pH meter and electrode. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
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-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
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-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. 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-022/025	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.

Method ID	Methodology Summary
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.
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	347493-8
Date extracted	-			27/03/2024	4	27/03/2024	27/03/2024		27/03/2024	27/03/2024
Date analysed	-			03/04/2024	4	03/04/2024	03/04/2024		03/04/2024	03/04/2024
TRH C_6 - C_9	mg/kg	25	Org-023	<25	4	<25	<25	0	109	96
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	4	<25	<25	0	109	96
Benzene	mg/kg	0.2	Org-023	<0.2	4	<0.2	<0.2	0	98	89
Toluene	mg/kg	0.5	Org-023	<0.5	4	<0.5	<0.5	0	104	92
Ethylbenzene	mg/kg	1	Org-023	<1	4	<1	<1	0	105	92
m+p-xylene	mg/kg	2	Org-023	<2	4	<2	<2	0	118	103
o-Xylene	mg/kg	1	Org-023	<1	4	<1	<1	0	115	100
Naphthalene	mg/kg	1	Org-023	<1	4	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	101	4	99	97	2	94	86

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	347493-16
Date extracted	-			[NT]	15	27/03/2024	27/03/2024		27/03/2024	27/03/2024
Date analysed	-			[NT]	15	03/04/2024	03/04/2024		03/04/2024	03/04/2024
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	15	<25	<25	0	105	88
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	15	<25	<25	0	105	88
Benzene	mg/kg	0.2	Org-023	[NT]	15	<0.2	<0.2	0	99	80
Toluene	mg/kg	0.5	Org-023	[NT]	15	<0.5	<0.5	0	102	84
Ethylbenzene	mg/kg	1	Org-023	[NT]	15	<1	<1	0	101	85
m+p-xylene	mg/kg	2	Org-023	[NT]	15	<2	<2	0	112	95
o-Xylene	mg/kg	1	Org-023	[NT]	15	<1	<1	0	109	92
Naphthalene	mg/kg	1	Org-023	[NT]	15	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	15	89	95	7	93	89

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]	26	27/03/2024	27/03/2024		[NT]	[NT]
Date analysed	-			[NT]	26	03/04/2024	03/04/2024		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	26	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	26	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	26	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	26	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	26	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	26	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	26	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	26	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	26	99	82	19	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	347493-8
Date extracted	-			27/03/2024	4	27/03/2024	27/03/2024		27/03/2024	27/03/2024
Date analysed	-			29/03/2024	4	29/03/2024	29/03/2024		28/03/2024	29/03/2024
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	4	<50	<50	0	98	100
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	4	1300	370	111	91	108
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	4	1000	360	94	100	116
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	4	66	<50	28	98	100
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	4	2000	620	105	91	108
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	4	580	300	64	100	116
Surrogate o-Terphenyl	%		Org-020	84	4	113	98	14	111	88

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	347493-16
Date extracted	-			[NT]	15	27/03/2024	27/03/2024		27/03/2024	27/03/2024
Date analysed	-			[NT]	15	29/03/2024	29/03/2024		28/03/2024	29/03/2024
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	15	<50	<50	0	97	86
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	15	480	570	17	91	118
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	15	550	600	9	100	118
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	15	<50	<50	0	97	86
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	15	860	990	14	91	118
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	15	530	480	10	100	118
Surrogate o-Terphenyl	%		Org-020	[NT]	15	95	99	4	90	120

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	26	27/03/2024	27/03/2024		[NT]	[NT]
Date analysed	-			[NT]	26	29/03/2024	29/03/2024		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	26	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	26	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	26	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	26	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	26	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	26	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	26	86	83	4	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	347493-8
Date extracted	-			27/03/2024	4	27/03/2024	27/03/2024		27/03/2024	27/03/2024
Date analysed	-			28/03/2024	4	28/03/2024	28/03/2024		02/04/2024	28/03/2024
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	4	0.4	0.6	40	82	90
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	4	3.7	1.3	96	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	4	0.4	<0.1	120	80	90
Fluorene	mg/kg	0.1	Org-022/025	<0.1	4	0.5	0.1	133	80	88
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	4	7.1	1.7	123	86	86
Anthracene	mg/kg	0.1	Org-022/025	<0.1	4	4.0	1	120	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	4	33	7.4	127	82	99
Pyrene	mg/kg	0.1	Org-022/025	<0.1	4	39	8.9	126	80	97
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	4	26	6.0	125	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	4	15	3.8	119	72	85
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	4	31	7.9	119	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	4	22	5.5	120	70	91
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	4	9.6	2.5	117	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	4	2.9	0.8	114	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	4	11	3.1	112	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	107	4	104	102	2	108	90

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	347493-16
Date extracted	-			[NT]	15	27/03/2024	27/03/2024		27/03/2024	27/03/2024
Date analysed	-			[NT]	15	28/03/2024	28/03/2024		28/03/2024	03/04/2024
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	15	0.4	0.4	0	84	84
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	15	2.3	2.8	20	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	15	0.1	0.2	67	90	71
Fluorene	mg/kg	0.1	Org-022/025	[NT]	15	0.3	0.4	29	84	95
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	15	3.5	5.4	43	88	#
Anthracene	mg/kg	0.1	Org-022/025	[NT]	15	1.9	2.4	23	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	15	7.5	9.7	26	94	#
Pyrene	mg/kg	0.1	Org-022/025	[NT]	15	9.4	12	24	90	#
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	15	7.8	10	25	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	15	4.3	5.4	23	74	136
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	15	11	13	17	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	15	7.8	9.7	22	86	#
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	15	3.4	4.1	19	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	15	1.4	1.6	13	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	15	4.1	5.0	20	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	15	103	100	3	99	78

QUALITY CONTROL: PAHs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	26	27/03/2024	27/03/2024		[NT]	[NT]
Date analysed	-			[NT]	26	28/03/2024	28/03/2024		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	26	0.2	0.4	67	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	26	0.3	0.6	67	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	26	0.2	0.5	86	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	26	0.1	0.2	67	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	26	0.1	0.3	100	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	26	0.2	0.4	67	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	26	0.2	0.3	40	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	26	0.1	0.2	67	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	26	90	94	4	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	347493-8
Date extracted	-			27/03/2024	4	27/03/2024	27/03/2024		27/03/2024	27/03/2024
Date analysed	-			28/03/2024	4	28/03/2024	28/03/2024		28/03/2024	28/03/2024
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	110	114
HCB	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	108	116
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	86	100
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	90	84
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	124	116
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	132	122
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	136	136
Endrin	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	98	106
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	108	82
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	124	82
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	75	4	89	96	8	104	89

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	27/03/2024	27/03/2024		[NT]	[NT]
Date analysed	-			[NT]	15	28/03/2024	28/03/2024		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	15	93	93	0	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	26	27/03/2024	27/03/2024		[NT]	[NT]
Date analysed	-			[NT]	26	28/03/2024	28/03/2024		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	26	89	89	0	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	347493-8
Date extracted	-			27/03/2024	4	27/03/2024	27/03/2024		27/03/2024	27/03/2024
Date analysed	-			28/03/2024	4	28/03/2024	28/03/2024		28/03/2024	28/03/2024
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	124	90
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	90	76
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	98	70
Malathion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	108	62
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	92	78
Fenthion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	92	78
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	110	78
Phosalone	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	75	4	89	96	8	104	89

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	27/03/2024	27/03/2024		[NT]	[NT]
Date analysed	-			[NT]	15	28/03/2024	28/03/2024		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	15	93	93	0	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	26	27/03/2024	27/03/2024		[NT]	[NT]
Date analysed	-			[NT]	26	28/03/2024	28/03/2024		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	26	89	89	0	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	347493-8
Date extracted	-			27/03/2024	4	27/03/2024	27/03/2024		27/03/2024	27/03/2024
Date analysed	-			28/03/2024	4	28/03/2024	28/03/2024		28/03/2024	28/03/2024
Aroclor 1016	mg/kg	0.1	Org-021/022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	<0.1	4	<0.1	<0.1	0	88	80
Aroclor 1260	mg/kg	0.1	Org-021/022/025	<0.1	4	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	75	4	96	96	0	103	91

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	15	27/03/2024	27/03/2024		[NT]	[NT]
Date analysed	-			[NT]	15	28/03/2024	28/03/2024		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021/022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021/022/025	[NT]	15	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	[NT]	15	97	95	2	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	26	27/03/2024	27/03/2024		[NT]	[NT]
Date analysed	-			[NT]	26	28/03/2024	28/03/2024		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021/022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021/022/025	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	[NT]	26	91	91	0	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	347493-8
Date prepared	-			28/03/2024	4	28/03/2024	28/03/2024		28/03/2024	28/03/2024
Date analysed	-			02/04/2024	4	02/04/2024	02/04/2024		02/04/2024	02/04/2024
Arsenic	mg/kg	4	Metals-020	<4	4	5	4	22	100	106
Cadmium	mg/kg	0.4	Metals-020	<0.4	4	<0.4	<0.4	0	96	105
Chromium	mg/kg	1	Metals-020	<1	4	13	13	0	111	109
Copper	mg/kg	1	Metals-020	<1	4	22	24	9	97	113
Lead	mg/kg	1	Metals-020	<1	4	19	39	69	100	109
Mercury	mg/kg	0.1	Metals-021	<0.1	4	<0.1	<0.1	0	83	86
Nickel	mg/kg	1	Metals-020	<1	4	25	29	15	96	108
Zinc	mg/kg	1	Metals-020	<1	4	23	35	41	98	106

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	347493-16
Date prepared	-			[NT]	15	28/03/2024	28/03/2024		28/03/2024	28/03/2024
Date analysed	-			[NT]	15	02/04/2024	02/04/2024		02/04/2024	02/04/2024
Arsenic	mg/kg	4	Metals-020	[NT]	15	<4	<4	0	108	105
Cadmium	mg/kg	0.4	Metals-020	[NT]	15	<0.4	<0.4	0	104	99
Chromium	mg/kg	1	Metals-020	[NT]	15	15	16	6	108	110
Copper	mg/kg	1	Metals-020	[NT]	15	63	49	25	101	110
Lead	mg/kg	1	Metals-020	[NT]	15	32	45	34	110	108
Mercury	mg/kg	0.1	Metals-021	[NT]	15	<0.1	<0.1	0	86	102
Nickel	mg/kg	1	Metals-020	[NT]	15	60	50	18	103	102
Zinc	mg/kg	1	Metals-020	[NT]	15	50	53	6	105	97

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	26	28/03/2024	28/03/2024		[NT]	[NT]
Date analysed	-			[NT]	26	02/04/2024	02/04/2024		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	26	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	26	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	26	14	12	15	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	26	9	16	56	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	26	12	21	55	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	26	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	26	15	23	42	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	26	16	23	36	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			27/03/2024	4	27/03/2024	27/03/2024		27/03/2024	[NT]
Date analysed	-			27/03/2024	4	27/03/2024	27/03/2024		27/03/2024	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	4	<5	<5	0	85	[NT]

QUALITY CONTROL: PFAS in Soils Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	347493-16
Date prepared	-			28/03/2024	3	28/03/2024	28/03/2024		28/03/2024	28/03/2024
Date analysed	-			28/03/2024	3	28/03/2024	28/03/2024		28/03/2024	28/03/2024
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	<0.1	3	<0.1	<0.1	0	100	92
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	<0.1	3	0.1	<0.1	0	103	93
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	<0.1	3	<0.1	<0.1	0	96	90
6:2 FTS	µg/kg	0.1	Org-029	<0.1	3	<0.1	<0.1	0	95	90
8:2 FTS	µg/kg	0.2	Org-029	<0.2	3	<0.2	<0.2	0	98	91
Surrogate $^{13}C_8$ PFOS	%		Org-029	102	3	110	106	4	105	110
Surrogate $^{13}C_2$ PFOA	%		Org-029	97	3	100	100	0	102	100
Extracted ISTD $^{18}O_2$ PFHxS	%		Org-029	100	3	103	102	1	102	100
Extracted ISTD $^{13}C_4$ PFOS	%		Org-029	99	3	97	97	0	99	90
Extracted ISTD $^{13}C_4$ PFOA	%		Org-029	105	3	110	103	7	103	103
Extracted ISTD $^{13}C_2$ 6:2FTS	%		Org-029	115	3	114	105	8	112	100
Extracted ISTD $^{13}C_2$ 8:2FTS	%		Org-029	117	3	105	107	2	112	102

QUALITY CONTROL: Misc Inorg - Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			28/03/2024	15	28/03/2024	28/03/2024		28/03/2024	[NT]
Date analysed	-			28/03/2024	15	28/03/2024	28/03/2024		28/03/2024	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	15	9.2	9.1	1	100	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			04/04/2024	[NT]	[NT]	[NT]	[NT]	04/04/2024	[NT]
Date analysed	-			04/04/2024	[NT]	[NT]	[NT]	[NT]	04/04/2024	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	108	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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

PAHs in Soil - The RPD for duplicate results is accepted due to the non homogenous nature of sample 347493-4.
PAHs in Soil - # Percent recovery for the surrogate/matrix spike is not possible to report as the high concentration of analytes in sample/s 347493-16ms have caused interference.

TRH_S_NEPM:The RPD for duplicate results is accepted due to the non homogenous nature of sample 347493-4.

For PFAS Extracted Internal Standards denoted with # or outside the 50-150% acceptance range, the respective target analyte results may be unaffected, in other circumstances the PQL has been raised to accommodate the outlier(s).

Acid Extractable Metals in Soil:
- The laboratory RPD acceptance criteria has been exceeded for 347493-4 for Pb and Zn. Therefore a triplicate result has been issued as laboratory sample number 347493-34.
- The laboratory RPD acceptance criteria has been exceeded for 347493-26 for Cu, Pb and Ni. Therefore a triplicate result has been issued as laboratory sample number 347493-35.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos according to ASB-001 asbestos subsampling procedure. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab/MPL recommends supplying 40-60g or 500ml of sample in its own container.
Note: Samples 347493-1, 2, 5, 6, 9, 10, 11, 13, 18, 20, 21, 24 were sub-sampled from bags provided by the client.

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

CoC: 26/03/24,1024

Douglas PARTNERS

CHAIN OF CUSTODY DESPATCH SHEET

Project No: 227190.01	**Suburb:** Rydalmere		**To:** Envirolab Services
Project Manager: Joel James-Hall	**Order Number:** -	**Sampler:** SAF/JBC	12 Ashley St, Chatswood NSW 2067
Email: joel.james-hall@douglaspartners.com.au; johann.chalache; huy.tran			**Attn:** Sample Receipt
Turnaround time: ☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day			(02) 9910 6200 samplereceipt@envirolab.cor
Prior Storage: ☑ Fridge ☐ Freezer ☐ Esky ☐ Shelf	**Do samples contain 'potential' HBM?** ☐ No	☑ Yes (YES, handle, transport, 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 M - Material	Container Type: G - glass P - plastic	Analytes: Combo 8AN	Combo 3AN	Combo 3A	PFAS (short suite)	pH	CEC	Combo 3	BTEX				Notes/ Preservation/ Additional Requirements
1	BH7	0.1	0.2	24/03/24	S	G,P			x									
2	BH7	0.9	1	24/03/24	S	G,P			x									
3	BH8	0.3	0.4	24/03/24	S	G,P				x								
4	BH8	0.4	0.5	24/03/24	S	G,P	x											
5	BH8	1.3	1.4	24/03/24	S	G,P			x									
6	BH9	0.5	0.7	24/03/24	S	G,P			x									
7	BH10	0.1	0.2	24/03/24	S	G,P				x								
8	BH10	0.3	0.4	24/03/24	S	G,P	x											
9	BH11	0.1	0.2	24/03/24	S	G,P			x									
10	BH11	0.8	0.9	24/03/24	S	G,P			x									
11	BH12	0.1	0.2	24/03/24	S	G,P			x	x								
12	BH13	0	0.2	24/03/24	S	G,P				x								
13	BH13	1	1.2	24/03/24	S	G,P			x									
14	BH14	0.1	0.2	24/03/24	S	G,P				x								

ENVIROLAB GROUP

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

Job No: 347493
Date Received: 26/3/24
Time Received: 1240
Received By: CW
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Metals to analyse: HM8 (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)			**LAB RECEIPT**
Number of samples in container:	**Transported to laboratory by:** Courier		**Lab Ref. No:** 347493
Send results to: Douglas Partners Pty Ltd			**Received by:** OLIVIA WILLIAMS
Address: 96 Hermitage Road, West Ryde NSW 211	**Phone:** (02) 9809 0666		**Date & Time:** 26/3/24 1240
Relinquished by: JBC	**Date:** 13/03/2024	**Signed:**	**Signed:** CW

Douglas PARTNERS

CHAIN OF CUSTODY DESPATCH SHEET

Project No: 227190.01	**Suburb:** Rydalmere		**To:** Envirolab Services
Project Manager: Joel James-Hall			**Dispatch date:** 45364

Lab ID	Sample ID			Date Sampled	Sample Type	Container Type	Analytes											Notes/ Preservation/ Additional Requirements
	Location / Other ID	Depth From	Depth To		S - soil W - water M -	G - glass P - plastic	Combo 8AN	Combo 3AN	Combo 3A	PFAS (short suite)	pH	CEC	Combo 3	BTEX				
15	BH14	0.4	0.5	24/03/24	S	G,P	x				x	x						
16	BH15	0.3	0.5	24/03/24	S	G,P	x			x								
17	BH16	0.5	0.6	24/03/24	S	G,P	x											
18	BH16	0.7	0.8	24/03/24	S	G,P			x									
19	BH17	0.4	0.5	24/03/24	S	G,P		x										
20	BH17	1.8	1.9	24/03/24	S	G,P			x									
21	BH18	0.5	0.7	24/03/24	S	G,P			x									
22	BH19	0.4	0.5	24/03/24	S	G,P		x										
23	BH19	0.9	1	24/03/24	S	G,P	x					-						
24	BH19	1.3	1.4	24/03/24	S	G,P			x		x	x						
25	BH20	0.1	0.2	24/03/24	S	G,P				x								
26	BH20	0.4	0.5	24/03/24	S	G,P	x											
27	BH20	0.9	1	24/03/24	S	G							x					
28	BH21	0.1	0.2	24/03/24	S	G,P				x								
29	BH21	0.3	0.4	24/03/24	S	G,P	x											
30	BD1/20240324			24/03/24	S	G							x					
40	BD2/20240324			24/03/24	S	G							x					Intralab - Send to ALS

#347493

Douglas PARTNERS

CHAIN OF CUSTODY DESPATCH SHEET

Project No: 227190.01				Suburb: Rydalmere										To: Envirolab Services				
Project Manager: Joel James-Hall														Dispatch date: 45364				
Lab ID	Sample ID			Date Sampled	Sample Type	Container Type	Analytes											Notes/ Preservation/ Additional Requirements
	Location /Other ID	Depth From	Depth To		S - soil W - water M -	G - glass P - plastic	Combo 8AN	Combo 3AN	Combo 3A	PFAS (short	pH	CEC	Combo 3	BTEX				
31	BD3/20240324			24/03/24	S	G							x					
32	TS													x				
33	TB													x				
																		1347493

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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
Attention	Joel James-Hall

Sample Login Details

Your reference	227190.01, Rydalmere
Envirolab Reference	347493
Date Sample Received	26/03/2024
Date Instructions Received	26/03/2024
Date Results Expected to be Reported	04/04/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	33 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	5
Cooling Method	Ice Pack
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:

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils	Asbestos ID - soils NEPM	PFAS in Soils Short	Misc Inorg - Soil	CEC
BH7-0.1-0.2	✓	✓	✓				✓		✓				
BH7-0.9-1	✓	✓	✓				✓		✓				
BH8-0.3-0.4											✓		
BH8-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓		✓			
BH8-1.3-1.4	✓	✓	✓				✓		✓				
BH9-0.5-0.7	✓	✓	✓				✓		✓				
BH10-0.1-0.2											✓		
BH10-0.3-0.4	✓	✓	✓	✓	✓	✓	✓	✓		✓			
BH11-0.1-0.2	✓	✓	✓				✓		✓				
BH11-0.8-0.9	✓	✓	✓				✓		✓				
BH12-0.1-0.2	✓	✓	✓				✓		✓		✓		
BH13-0-0.2											✓		
BH13-1-1.2	✓	✓	✓				✓		✓				
BH14-0.1-0.2											✓		
BH14-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓	✓
BH15-0.3-0.5	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		
BH16-0.5-0.6	✓	✓	✓	✓	✓	✓	✓	✓		✓			
BH16-0.7-0.8	✓	✓	✓				✓		✓				
BH17-0.4-0.5	✓	✓	✓				✓			✓			
BH17-1.8-1.9	✓	✓	✓				✓		✓				
BH18-0.5-0.7	✓	✓	✓				✓		✓				
BH19-0.4-0.5	✓	✓	✓				✓			✓			
BH19-0.9-1	✓	✓	✓	✓	✓	✓	✓	✓		✓			
BH19-1.3-1.4	✓	✓	✓				✓		✓			✓	✓
BH20-0.1-0.2											✓		
BH20-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓		✓			
BH20-0.9-1	✓	✓	✓				✓						
BH21-0.1-0.2											✓		
BH21-0.3-0.4	✓	✓	✓	✓	✓	✓	✓	✓		✓			
BD1/20240324	✓	✓	✓				✓						
BD3/20240324	✓	✓	✓				✓						
TS	✓												

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Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils	Asbestos ID - soils NEPM	PFAS in Soils Short	Misc Inorg - Soil	CEC
TB	✓												

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

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
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.

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CERTIFICATE OF ANALYSIS 347493-A

Client Details

Client	Douglas Partners Pty Ltd
Attention	Johann Chalache
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**227190.01, Rydalmere**
Number of Samples	Additional TCLP analysis
Date samples received	26/03/2024
Date completed instructions received	05/04/2024

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	12/04/2024
Date of Issue	11/04/2024

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Results Approved By
Dragana Tomas, Senior Chemist
Loren Bardwell, Development Chemist
Sean McAlary, Chemist (FAS)

Authorised By
Nancy Zhang, Laboratory Manager

TCLP Preparation - Acid						
Our Reference		347493-A-1	347493-A-3	347493-A-4	347493-A-9	347493-A-11
Your Reference	UNITS	BH7	BH8	BH8	BH11	BH12
Depth		0.1-0.2	0.3-0.4	0.4-0.5	0.1-0.2	0.1-0.2
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
pH of soil for fluid# determ.	pH units	9.5	10.9	9.5	9.8	10.7
pH of soil TCLP (after HCl)	pH units	1.8	2.2	1.7	1.7	1.8
Extraction fluid used		1	1	1	1	1
pH of final Leachate	pH units	5.2	7.7	5.0	5.1	6.9

TCLP Preparation - Acid						
Our Reference		347493-A-15	347493-A-16	347493-A-17	347493-A-22	347493-A-28
Your Reference	UNITS	BH14	BH15	BH16	BH19	BH21
Depth		0.4-0.5	0.3-0.5	0.5-0.6	0.4-0.5	0.1-0.2
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
pH of soil for fluid# determ.	pH units	9.8	9.4	10.3	9.4	9.7
pH of soil TCLP (after HCl)	pH units	1.7	1.7	1.7	1.7	1.7
Extraction fluid used		1	1	1	1	1
pH of final Leachate	pH units	5.2	5.0	5.5	5.0	5.2

PAHs in TCLP (USEPA 1311)					
Our Reference		347493-A-4	347493-A-15	347493-A-16	347493-A-22
Your Reference	UNITS	BH8	BH14	BH15	BH19
Depth		0.4-0.5	0.4-0.5	0.3-0.5	0.4-0.5
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	10/04/2024	10/04/2024	10/04/2024	10/04/2024
Date analysed	-	11/04/2024	11/04/2024	11/04/2024	11/04/2024
Naphthalene in TCLP	mg/L	0.0002	0.0002	0.0002	0.0002
Acenaphthylene in TCLP	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Acenaphthene in TCLP	mg/L	0.0003	<0.0001	0.0001	0.0001
Fluorene in TCLP	mg/L	0.0002	<0.0001	0.0003	0.0003
Phenanthrene in TCLP	mg/L	0.001	0.0004	0.0005	0.002
Anthracene in TCLP	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Fluoranthene in TCLP	mg/L	0.0009	0.0002	0.0001	0.0006
Pyrene in TCLP	mg/L	0.0008	0.0002	0.0001	0.0005
Benzo(a)anthracene in TCLP	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Chrysene in TCLP	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Benzo(bjk)fluoranthene in TCLP	mg/L	<0.0002	<0.0002	<0.0002	<0.0002
Benzo(a)pyrene in TCLP	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Dibenzo(a,h)anthracene in TCLP	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Benzo(g,h,i)perylene in TCLP	mg/L	<0.0001	<0.0001	<0.0001	<0.0001
Total +ve PAH's	mg/L	0.0038	0.001	0.0013	0.0035
Surrogate p-Terphenyl-d14	%	72	118	94	95

Metals from Leaching Fluid pH 2.9 or 5					
Our Reference		347493-A-1	347493-A-9	347493-A-15	347493-A-17
Your Reference	UNITS	BH7	BH11	BH14	BH16
Depth		0.1-0.2	0.1-0.2	0.4-0.5	0.5-0.6
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	10/04/2024	10/04/2024	10/04/2024	10/04/2024
Date analysed	-	10/04/2024	10/04/2024	10/04/2024	10/04/2024
Nickel	mg/L	0.2	0.30	0.05	0.04

PFAS in TCLP Short					
Our Reference		347493-A-3	347493-A-11	347493-A-16	347493-A-28
Your Reference	UNITS	BH8	BH12	BH15	BH21
Depth		0.3-0.4	0.1-0.2	0.3-0.5	0.1-0.2
Date Sampled		24/03/2024	24/03/2024	24/03/2024	24/03/2024
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	09/04/2024	09/04/2024	09/04/2024	09/04/2024
Date analysed	-	09/04/2024	09/04/2024	09/04/2024	09/04/2024
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	<0.01	<0.01	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02	<0.02
Surrogate $^{13}C_8$ *PFOS*	%	97	96	99	95
Surrogate $^{13}C_2$ *PFOA*	%	100	103	97	99
Extracted ISTD $^{18}O_2$ *PFHxS*	%	92	91	95	96
Extracted ISTD $^{13}C_4$ *PFOS*	%	95	96	95	102
Extracted ISTD $^{13}C_4$ *PFOA*	%	96	97	99	102
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	99	71	104	103
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	123	111	105	113
Total Positive PFHxS & PFOS	µg/L	<0.01	<0.01	<0.01	<0.01
Total Positive PFOS & PFOA	µg/L	<0.01	<0.01	<0.01	<0.01
Total Positive PFAS	µg/L	<0.01	<0.01	<0.01	<0.01

Method ID	Methodology Summary
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439. 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.
Metals-020	Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3. Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.
Org-022/025	Leachates are extracted with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: PAHs in TCLP (USEPA 1311)						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			10/04/2024	15	10/04/2024	10/04/2024		10/04/2024	[NT]
Date analysed	-			11/04/2024	15	11/04/2024	11/04/2024		11/04/2024	[NT]
Naphthalene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	15	0.0002	0.0002	0	97	[NT]
Acenaphthylene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	15	<0.0001	<0.0001	0	[NT]	[NT]
Acenaphthene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	15	<0.0001	<0.0001	0	89	[NT]
Fluorene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	15	<0.0001	<0.0001	0	95	[NT]
Phenanthrene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	15	0.0004	0.0004	0	79	[NT]
Anthracene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	15	<0.0001	<0.0001	0	[NT]	[NT]
Fluoranthene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	15	0.0002	0.0002	0	86	[NT]
Pyrene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	15	0.0002	0.0002	0	86	[NT]
Benzo(a)anthracene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	15	<0.0001	<0.0001	0	[NT]	[NT]
Chrysene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	15	<0.0001	<0.0001	0	77	[NT]
Benzo(bjk)fluoranthene in TCLP	mg/L	0.0002	Org-022/025	<0.0002	15	<0.0002	<0.0002	0	[NT]	[NT]
Benzo(a)pyrene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	15	<0.0001	<0.0001	0	97	[NT]
Indeno(1,2,3-c,d)pyrene - TCLP	mg/L	0.0001	Org-022/025	<0.0001	15	<0.0001	<0.0001	0	[NT]	[NT]
Dibenzo(a,h)anthracene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	15	<0.0001	<0.0001	0	[NT]	[NT]
Benzo(g,h,i)perylene in TCLP	mg/L	0.0001	Org-022/025	<0.0001	15	<0.0001	<0.0001	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	87	15	118	88	29	81	[NT]

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	347493-A-1
Date extracted	-			10/04/2024	15	10/04/2024	10/04/2024		10/04/2024	10/04/2024
Date analysed	-			10/04/2024	15	10/04/2024	10/04/2024		10/04/2024	10/04/2024
Nickel	mg/L	0.02	Metals-020	<0.02	15	0.05	0.05	0	100	111

QUALITY CONTROL: PFAS in TCLP Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			09/04/2024	3	09/04/2024	09/04/2024		09/04/2024	[NT]
Date analysed	-			09/04/2024	3	09/04/2024	09/04/2024		09/04/2024	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	3	<0.01	<0.01	0	115	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	3	<0.01	<0.01	0	112	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	3	<0.01	<0.01	0	110	[NT]
6:2 FTS	µg/L	0.01	Org-029	<0.01	3	<0.01	<0.01	0	116	[NT]
8:2 FTS	µg/L	0.02	Org-029	<0.02	3	<0.02	<0.02	0	120	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	104	3	97	101	4	96	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	99	3	100	100	0	100	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	97	3	92	91	1	92	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	94	3	95	91	4	100	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	99	3	96	95	1	97	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	92	3	99	97	2	87	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	118	3	123	110	11	109	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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.

Anna Bui

From: Nick Sarlamis
Sent: Friday, 5 April 2024 4:00 PM
To: Anna Bui; Customer Service
Cc: Organics NSW; Metals NSW
Subject: FW: Results for Registration 347493 227190.01, Rydalmere

Follow Up Flag: Follow up
Flag Status: Flagged

Hi All,
A job request please.

From: Johann Chalache <johann.chalache@douglaspartners.com.au>
Sent: Friday, April 5, 2024 3:48 PM
To: Nick Sarlamis <NSarlamis@envirolab.com.au>; Joel James-Hall <joel.james-hall@douglaspartners.com.au>; Huy Tran <Huy.Tran@douglaspartners.com.au>
Subject: RE: Results for Registration 347493 227190.01, Rydalmere

Hi Nick,

Could we please order the following TCLP?

9 - BH8/0.4-0.4 - PAH
15 - BH14/0.4-0.5 – PAH
22 - BH19/0.4-0.5 - PAH
16 - BH15/0.3-0.5 - PAH
9 - BH11/0.1-0.2 - Nickel
1 - BH7/0.1-0.2- Nickel
15 - BH14/0.4-0.4 - Nickel
17 - BH16/0.5-0.6 – Nickel
3 - BH8/0.3-0.4 – PFAS
11 - BH12/0.1-0.2 – PFAS
16 - BH15/0.3-0.5 – PFAS
28 - BH21/0.1-0.2 – PFAS

ELJ REF: 347493-A
TAT: STANDARD
DUE: 12/4/24
AB.

Kind Regards

Johann Chalache | Environmental Engineer

02 9809 0666 +61 474 371 272 Johann.Chalache@douglaspartners.com.au

www.douglaspartners.com.au 96 Hermitage Road, West Ryde
NSW 2114 | Wallumedegal Country
PO Box 472, West Ryde, NSW 1685

Douglas PARTNERS | GROUNDED EXPERTISE

Click here to learn about our awards and achievements.

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
Attention	Johann Chalache

Sample Login Details

Your reference	227190.01, Rydalmere
Envirolab Reference	347493-A
Date Sample Received	26/03/2024
Date Instructions Received	05/04/2024
Date Results Expected to be Reported	12/04/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	Additional TCLP analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	5
Cooling Method	Ice Pack
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	TCLP Preparation - Acid	PAHs in TCLP (USEPA 1311)	Nickel	PFAS in TCLP Short	On Hold
BH7-0.1-0.2	✓		✓		
BH7-0.9-1					✓
BH8-0.3-0.4	✓			✓	
BH8-0.4-0.5	✓	✓			
BH8-1.3-1.4					✓
BH9-0.5-0.7					✓
BH10-0.1-0.2					✓
BH10-0.3-0.4					✓
BH11-0.1-0.2	✓		✓		
BH11-0.8-0.9					✓
BH12-0.1-0.2	✓			✓	
BH13-0-0.2					✓
BH13-1-1.2					✓
BH14-0.1-0.2					✓
BH14-0.4-0.5	✓	✓	✓		
BH15-0.3-0.5	✓	✓		✓	
BH16-0.5-0.6	✓		✓		
BH16-0.7-0.8					✓
BH17-0.4-0.5					✓
BH17-1.8-1.9					✓
BH18-0.5-0.7					✓
BH19-0.4-0.5	✓	✓			
BH19-0.9-1					✓
BH19-1.3-1.4					✓
BH20-0.1-0.2					✓
BH20-0.4-0.5					✓
BH20-0.9-1					✓
BH21-0.1-0.2	✓			✓	
BH21-0.3-0.4					✓
BD1/20240324					✓
BD3/20240324					✓
TS					✓

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	TCLP Preparation - Acid	PAHs in TCLP (USEPA 1311)	Nickel	PFAS in TCLP Short	On Hold
TB					✓
BH8 - [TRIPLICATE]-0.4-0.5					✓
BH20 - [TRIPLICATE]-0.4-0.5					✓

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.

CERTIFICATE OF ANALYSIS

Work Order	: **ES2410206**	Page	: 1 of 6
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: JOEL JAMES-HALL	Contact	: Customer Services ES
Address	:	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: 227190.01	Date Samples Received	: 27-Mar-2024 17:03
Order number	: ----	Date Analysis Commenced	: 02-Apr-2024
C-O-C number	: ----	Issue Date	: 08-Apr-2024 14:06
Sampler	: ----		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contract for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a.h)anthracene (1.0), Benzo(g.h.i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero, for 'TEQ 1/2LOR' are treated as half the reported LOR, and for 'TEQ LOR' are treated as being equal to the reported LOR. Note: TEQ 1/2LOR and TEQ LOR will calculate as 0.6mg/Kg and 1.2mg/Kg respectively for samples with non-detects for all of the eight TEQ PAHs.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BD2/20240324	---	---	----	----
			Sampling date / time	24-Mar-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit	ES2410206-001	--------	--------	--------	--------
				Result	---	---	---	---
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**25.3**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	**6**	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**22**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**6**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**20**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	**8**	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**6**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BD2/20240324	---	---	----	----
				Sampling date / time	24-Mar-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2410206-001	--------	--------	--------	--------
					Result	---	---	---	---
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg		**0.6**	----	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg		**1.2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BD2/20240324	---	---	----	----
				Sampling date / time	24-Mar-2024 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2410206-001	--------	--------	--------	--------
					Result	---	---	---	---
EP080: BTEXN - Continued									
^ **Total Xylenes**	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**81.3**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**75.4**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**85.2**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**74.3**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**85.0**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**83.2**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**103**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		**95.3**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**97.0**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	63	123
2-Chlorophenol-D4	93951-73-6	66	122
2.4.6-Tribromophenol	118-79-6	40	138
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	70	122
Anthracene-d10	1719-06-8	66	128
4-Terphenyl-d14	1718-51-0	65	129
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	63	125
Toluene-D8	2037-26-5	67	124
4-Bromofluorobenzene	460-00-4	66	131

QUALITY CONTROL REPORT

Work Order	: **ES2410206**	Page	: 1 of 7
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: JOEL JAMES-HALL	Contact	: Customer Services ES
Address	:	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: ----	Telephone	: +61 2 8784 8555
Project	: 227190.01	Date Samples Received	: 27-Mar-2024
Order number	: ----	Date Analysis Commenced	: 02-Apr-2024
C-O-C number	: ----	Issue Date	: 08-Apr-2024
Sampler	: ----		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

Accreditation No. 825
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ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC
* = The final LOR has been raised due to dilution or other sample specific cause; adjusted LOR is shown in brackets. The duplicate ranges for Acceptable RPD% are applied to the final LOR where applicable.

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EG005(ED093)T: Total Metals by ICP-AES (QC Lot: 5704339)									
ES2410169-003	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	10	11	12.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	3	3	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	176	190	7.6	0% - 20%
		EG005T: Zinc	7440-66-6	5	mg/kg	31	27	13.0	No Limit
ES2410350-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	8	4	55.2	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	<2	<2	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	8	7	0.0	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	21	15	32.2	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 5704349)									
ES2410207-001	Anonymous	EA055: Moisture Content	----	0.1 (1.0)*	%	12.0	12.8	6.7	0% - 50%
ES2410408-002	Anonymous	EA055: Moisture Content	----	0.1	%	27.7	29.2	5.2	0% - 20%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 5704338)									
ES2409505-013	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	0.3	0.5	43.4	No Limit
ES2410087-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 5697573)									
ES2410161-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5697572)									
ES2410161-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 5699045)									
ES2410332-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2410332-002	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5697572)									
ES2410161-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 5699045)									
ES2410332-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2410332-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080: BTEXN (QC Lot: 5699045)									
ES2410332-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080: BTEXN (QC Lot: 5699045) - continued									
ES2410332-001	Anonymous	EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit
ES2410332-002	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.0	No Limit

Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5704339)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	99.1	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	125	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	114	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	99.4	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	95.1	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	96.6	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	89.6	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5704338)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	100	70.0	125
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5697573)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	90.3	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	84.4	72.0	124
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	88.8	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	87.5	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	90.3	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	94.1	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	91.7	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	91.8	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	87.8	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	89.4	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	87.7	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	94.1	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	84.8	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	92.0	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	86.0	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	80.8	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5697572)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	102	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	102	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	100	71.0	129

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5699045)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	78.6	72.2	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5697572)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	104	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	101	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	87.5	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5699045)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	76.7	72.4	133
EP080: BTEXN (QCLot: 5699045)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	82.8	76.0	124
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	90.9	78.5	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	93.5	77.4	121
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	94.0	78.2	121
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	96.0	81.3	121
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	94.7	78.8	122

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: **SOIL**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 5704339)							
ES2410169-003	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	93.8	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	86.3	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	100	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	98.7	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	100.0	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	97.4	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	95.7	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 5704338)							
ES2409505-013	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	99.7	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 5697573)							
ES2410161-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	93.1	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	96.6	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5697572)							
ES2410161-001	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	100	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	118	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	114	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 5699045)							
ES2410332-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	83.7	60.4	142
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5697572)							
ES2410161-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	96.2	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	116	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	117	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 5699045)							
ES2410332-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	81.8	61.1	142
EP080: BTEXN (QCLot: 5699045)							
ES2410332-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	94.6	62.1	122
		EP080: Toluene	108-88-3	2.5 mg/kg	90.2	66.6	119
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	91.6	67.4	123
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	86.0	66.4	121
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	90.3	70.7	121
		EP080: Naphthalene	91-20-3	2.5 mg/kg	93.5	61.1	115

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2410206**	Page	: 1 of 4
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: JOEL JAMES-HALL	Telephone	: +61 2 8784 8555
Project	: 227190.01	Date Samples Received	: 27-Mar-2024
Site	: ----	Issue Date	: 08-Apr-2024
Sampler	: ----	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
BD2/20240324	**24-Mar-2024**	**----**	----	----	**04-Apr-2024**	07-Apr-2024	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
BD2/20240324	**24-Mar-2024**	**04-Apr-2024**	20-Sep-2024	✓	**05-Apr-2024**	20-Sep-2024	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
BD2/20240324	**24-Mar-2024**	**04-Apr-2024**	21-Apr-2024	✓	**08-Apr-2024**	21-Apr-2024	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
BD2/20240324	**24-Mar-2024**	**02-Apr-2024**	07-Apr-2024	✓	**02-Apr-2024**	12-May-2024	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071)							
BD2/20240324	**24-Mar-2024**	**02-Apr-2024**	07-Apr-2024	✓	**03-Apr-2024**	12-May-2024	✓
Soil Glass Jar - Unpreserved (EP080)							
BD2/20240324	**24-Mar-2024**	**03-Apr-2024**	07-Apr-2024	✓	**03-Apr-2024**	07-Apr-2024	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP071)							
BD2/20240324	**24-Mar-2024**	**02-Apr-2024**	07-Apr-2024	✓	**03-Apr-2024**	12-May-2024	✓
Soil Glass Jar - Unpreserved (EP080)							
BD2/20240324	**24-Mar-2024**	**03-Apr-2024**	07-Apr-2024	✓	**03-Apr-2024**	07-Apr-2024	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
BD2/20240324	**24-Mar-2024**	**03-Apr-2024**	07-Apr-2024	✓	**03-Apr-2024**	07-Apr-2024	✓

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PAH/Phenols (SIM)	EP075(SIM)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PAH/Phenols (SIM)	EP075(SIM)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
PAH/Phenols (SIM)	EP075(SIM)	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM Schedule B(3).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to APHA 3112 Hg - B (Flow-injection (SnCl2) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015 Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM Schedule B(3).
PAH/Phenols (SIM)	EP075(SIM)	SOIL	In house: Referenced to USEPA SW 846 - 8270. Extracts are analysed by Capillary GC/MS in Selective Ion Mode (SIM) and quantification is by comparison against an established 5 point calibration curve. This method is compliant with NEPM Schedule B(3)
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM Schedule B(3) amended.

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM Schedule B(3).
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na2SO4 and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.

Appendix J

Quality Assurance and Quality Control

1. 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 field QC samples are included in Tables QA1 to QA3 at the end of this appendix.

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	5% of primary samples; <30% RPD	C
Inter-laboratory replicates	5% 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
Laboratory Duplicate	1 per lab batch; As laboratory certificate	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 (results in bold). The exceedances are not, however, considered to be of concern given that:

- the actual differences in the concentrations of the replicate pairs where RPD exceedances occurred were typically low;
- replicates, rather than homogenised duplicates, were used to minimise risk of volatile loss, hence greater analytical variability between replicate pairs can be expected;

- most of the recorded concentrations were relatively close to the PQL;
- the majority of RPD results from a replicate pair were within the acceptable limits; and
- all other QA / QC parameters met the data quality indicators.

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

2. Data quality indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQI) 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	Opportunistic and systematic locations sampled.
	Preparation of borehole logs, sample location plan and chain of custody records.
	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 samplers used.
	Use of NATA registered laboratories, with test methods the same or similar between laboratories.

Data quality indicator	Method(s) of achievement
	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 DQO.
	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 DQI have been generally complied with.

3. Conclusion

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

4. 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

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	Metals								PAH				TRH						BTEX					
						Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene *	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ (Bap TEQ)	Total PAH	TRH C6 - C10	TRH >C10-C16	F1 ((>C6-C10) - BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene	Total Xylenes
346373	BH2	0.5 - 0.6 m	09/03/24	Soil	mg/kg	**4**	<0.4	**18**	**5**	**12**	<0.1	**5**	**9**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<2	<1
346373	BD1/20240309	-	09/03/24	Soil	mg/kg	**5**	<0.4	**19**	**5**	**13**	<0.1	**4**	**9**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<2	<1
			Difference		mg/kg	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD		%	22%	0%	5%	0%	8%	0%	22%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
347493	BH17	1.8 - 1.9 m	24/03/24	Soil	mg/kg	**4**	<0.4	**10**	**12**	**16**	<0.1	**2**	**7**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<2	<1
347493	BD1/20240324	-	24/03/24	Soil	mg/kg	**5**	<0.4	**10**	**11**	**16**	<0.1	**2**	**7**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<2	<1
			Difference		mg/kg	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD		%	22%	0%	0%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
347493	BH08	1.3-1.4	24/03/24	Soil	mg/kg	**6**	<0.4	**22**	**7**	**19**	<0.1	**8**	**9**	<1	0.5	0.6	4.4	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<2	<1
ALS	BD2/20240324	-	24/03/24	Soil	mg/kg	**6**	<1	**22**	**6**	**20**	<0.1	**8**	**6**	<0.5	<0.5	<0.5	<0.5	<10	<50	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5
			Difference		mg/kg	0	-	0	1	1	0	0	3	-	-	-	-	-	0	-	0	0	0	0	0	-	-	-	-
			RPD		%	0%	-	0%	15%	5%	0%	0%	**40%**	-	-	-	-	-	0%	-	0%	0%	0%	0%	0%	-	-	-	-
347493	BH11	0.8 - 0.9 m	24/03/24	Soil	mg/kg	<4	<0.4	**14**	**11**	**16**	<0.1	**6**	**6**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<2	<1
347493	BD3/20240324	-	24/03/24	Soil	mg/kg	**5**	<0.4	**15**	**11**	**17**	<0.1	**5**	**6**	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<2	<1
			Difference		mg/kg	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD		%	22%	0%	7%	0%	6%	0%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table QA2: Trip Blank Results

Sample ID	Sample Date	Media Being Sampled	Sample Type	Units	PAH	TRH		BTEX					
					Naphthalene [b]	TRH C6 - C10	F1 ((C6-C10)-BTEX)	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene	Total Xylenes
Trip Blank	09/03/24	Soil	Soil	mg/kg	<1	<25	<25	<0.2	<0.5	<1	<1	<2	<1
TB	24/03/24	Soil	Soil	mg/kg	<1	<25	<25	<0.2	<0.5	<1	<1	<2	<1

Table QA3: Trip Spike Results

Sample ID	Sample Date	Media Being Sampled	Sample Type	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene
Trip Spike	09/03/24	Soil	Soil	106	104	103	102	103
TS	24/03/24	Soil	Soil	107	107	106	105	104