Douglas Partners
Geotechnics / Environment / Groundwater

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Report on
Detailed Site Investigation (Contamination)

Proposed Aged Care Facility, Edinglassie Village
1-3 Emerald Street and 6-8 Troy Street, Emu Plains

Prepared for
The Uniting Church in Australia Property Trust for
Uniting (NSW.ACT)

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

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1. Introduction

Douglas Partners Pty Ltd (DP) has been engaged by The Uniting Church in Australia Property Trust for Uniting (NSW.ACT) to complete this Detailed Site Investigation (Contamination) (DSI) for Stage 2 of the proposed Aged Care Facility (the site) at part of 1-3 Emerald Street and 6-8 Troy Street, Emu Plains (also known as Endinglassie Village). The site is shown on Drawing 1, Appendix A.

The DSI was undertaken in accordance with DP's proposal P84503.01.P.001.Rev2 dated 16 February 2022.

The objective of the DSI is to assess the suitability of the site for the proposed development and determine whether further investigation and / or management is required. It is understood that the report will be used to support a corresponding Development Application.

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

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).

Three previous contamination investigations have been undertaken at the site as follows:

- Report on Preliminary Site Investigation, Proposed Aged Care Facility, 1-11 Emerald Street, Emu Plains. Project 84503.R.001.Rev0, 6 November 2014: Douglas Partners Pty Ltd. (DP, 2014).
- JBS&G. (2019). Detailed Site Investigation, 1-11 Emerald Street, Emu Plains NSW. Project 55566/120590 (rev1), 11 February 2019: JBS&G Pty Ltd. (JBS&G, 2019).
- Report on Preliminary Site Investigation (Contamination), Proposed Aged Care Facility, Endinglassie Village, Part 1-3 Emerald and 6-8 Troy Street, Emu Plains. Project 84503.02.R.001.Rev0 (DP, 2022).

The site boundaries for DP (2014) and JBS&G (2019) investigations are presented in Drawing 1. It is noted that the site boundaries for the previous investigations and the current investigation are not entirely the same.

2. Proposed Development

It is understood that the proposed development will include the construction of five independent / residential unit buildings of up to five storeys high over a common single level basement that is split into two halves due to an existing stormwater easement. The basement will require provisional excavation to a depth of 3.5 m to 4 m. In addition, new internal pavements areas will be constructed, together with upgraded landscaping and the installation of services. The proposed development follows the previous Stage 1 construction in the north-eastern part of the site. The proposed development is present in drawings are provided in Appendix A.

At the time of the current investigation a new on-grade carpark was being constructed to the south of the Stage 1 Building as indicated in Drawing 1. The footprints of the proposed basements are presented in Drawing 1.

3. Scope of Work

The scope of the investigation was as follows:

- Collation of the relevant data from the PSI for incorporation int the DSI;
- Development of a preliminary conceptual site model (CSM);
- Collection of soil samples from the six geotechnical boreholes (BH100 to BH105);
- In addition to six geotechnical boreholes, drilling of ten boreholes (BH107 to BH116) using hand tools to a depth of 1.5 m, 0.5 m into natural ground or prior refusal (whichever lesser);
- Collection of soil samples from boreholes BH100 to BH105 and BH107 to BH116 at regular depth intervals;
- Collection of groundwater samples from monitoring wells installed in Boreholes BH100 and BH102;
- Screening of all soil samples for volatile organic contaminants using a photo-ionisation detection (PID) instrument;
- Dispatch selected soil and groundwater samples (plus quality assurance and quality control (QA / QC) samples) to a NATA accredited laboratory for analysis for the following potential contaminants and parameters:
    - Priority metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Mn and Zn);
    - Total recoverable hydrocarbons (TRH);
    - Benzene, toluene, ethylbenzene and xylene (BTEX);
    - Polycyclic aromatic hydrocarbons (PAH);
    - Total Phenols;
    - Polychlorinated biphenyls (PCB);
    - Organochlorine pesticides (OCP);
    - Organophosphorus pesticides (OPP);
    - Poly-fluoroalkyl substances (PFAS);
    - Asbestos (in 40 g soil samples or material samples);
    - pH;

  - o electrical conductivity (EC); and
  - o Cation exchange capacity (CEC).
- Preparation of this report.

4. Site Information

Site Address	1-3 Emerald Street and 6-8 Troy Street, Emu Plains
Legal Description	Part of Lot 10, DP 1242243 Lot 15, DP 232740 Lot 14, DP 232740
Area	Approximately 1.5 ha
Zoning	R3 Medium density residential
Local Council Area	Penrith City Council
Current Use	1-3 Emerald Street - Retirement Village 6 Troy Street - Administration for Retirement Village 8 Troy Street - Residential
Surrounding Uses	North - Great Western Highway the retail (shopping centre) East - Emerald Street and residential South - Emu Plains Primary School West - Troy Street and residential

Note: Lot 10, DP 1242243 was formerly (in 2014) identified at Lot 16 in Deposited Plan 232740, Lot 1 in Deposited Plan 650543, Lot 9 in Deposited Plan 230580 and Lots 3 and 4 in Deposited Plan 758387.

Figure 1: Site Location

A site walkover was undertaken by an environmental engineer in 2014 for DP (2014) and again on 11 March 2022 for the current investigation. It is noted that due to current COVID restriction that inspections in 2022 were limited to outdoor areas. The general site topography was consistent with that described in Section 5.

The following key site features pertinent to the investigation are noted:

- The site was generally flat with a slight slope towards the south-west.

With regard to the part of 1-3 Emerald Street that is the subject of this investigation:

- An historic church adjacent Emerald Drive on the east side of site, dated circa 1800s;
- A plaque on the administration building entrance indicated the site was opened in 1982;
- The site is an aged care facility which offers varying levels of care from high care to independent premises;
- The site included a small substation located in the eastern portion of the site, towards Emerald Street;
- The site had a large number of stormwater drains distributed throughout its external garden and path areas. All drains were generally clean without staining. A large underground water or sewer pipe was also observed running along the southern boundary of the site;

- A kitchen facility was present in 2014 (Photo 3). Staff (in 2014) indicated there was no known grease trap for the kitchen on site. It was indicated, any oils used in fryers etc in the kitchen are changed by an external contractor;
- A workshop was observed in 2014 in the southwest corner of the site, was still present in 2022. Staff (in 2014) indicated wood and metal works are undertaken in the workshop, however, no access was possible at the time of inspection. A Dangerous Goods sign on the door of the workshop indicated storage of flammable liquid;
- Chemical stores were observed throughout the facility in 2014. No particular chemicals of concern were noted and all chemical stores were in an ordered condition. It was indicated to DP by staff that caustic substances may be used for cleaning of bed pans however the product could not be confirmed;
- Staff at the site in 2014 were unaware of any chemical manifests (or comprehensive list of Material Safety Data Sheets) or Hazardous Building Materials Register that may exist for the site;
- Structures in the eastern portion of the site had been demolished in 2022 and the subgrade prepared for the proposed on-grade carpark. It is understood that less than 0.5 m of subgrade material was imported to the site. It is DPs understanding that the imported fill (subgrade) was placed over the existing fill (where present) post demotion of the buildings to raise and level the area for the proposed car park;
- The north-west portion of the site was unchanged from 2014 and occupied by a number of one and two storey aged care apartments;
- The south-east corner of the site was unchanged from 2014 and occupied by a single storey aged care residences; and
- Although no suspected hazardous building materials were observed, a hazardous building materials inspection was not part of the project scope and it is possible given the age of the site that some may exist.

It is also noted that Stage 1 redevelopment in the north-eastern corner of the lot, which is outside the current investigation area had been completed.

With regard to 6 Troy Street:

- The western portion of the property was a former residential house that had been repurposed as the administration office of the aged care facility; and
- The western portion of the property was a on grade bitumen carpark.

With regard to 8 Troy Street:

- The property was a single storey brick residential house.

5. Environmental Setting

Regional Topography	General topography of the surrounding area is generally flat with a RL of approximately 28 m AHD sloping gently to the south-east towards the Nepean River. The bank of the Nepean River is approximately 750 m south-east and sits at an elevation of between approximately 16 to 26 m AHD.
Site Topography	The general site topography is relatively flat with site levels essentially consistent across the site, however, landscaping features and garden beds have resulted in some localised undulations. Landscaping comprises mostly grasses amongst a scattering of garden beds.
Soil Landscape	Reference to the Sydney 1:100,000 Soil Landscape sheet indicates the site is underlain by the Richmond Soil Landscape Group
Geology	Reference to the Sydney 1:100 000 Geological Series Sheet indicates that the site is underlain by Quaternary Sediments of the Cranebrook Formation. This is a fluvial deposit comprising sand, silt and clay.
Acid Sulfate Soils	Reference to the 1:25,000 Acid Sulfate Soil Risk Mapping, 1994-1998 indicates that the site is not in an area with potential acid sulfate soils
Surface Water	Surface water drains to stormwater drains. The Nepean River is approximately 750 m south-east of the site.
Groundwater	A search of the NSW Office of Water database (previously held by the Department of Natural Resources) was conducted on 2 October 2014 in DP (2014) for any registered water bores within a 1 km radius of the site. Details of the six bores are as follows: • GW075124 was identified as a test bore for the town water supply, no standing water level (SWL) was recorded; • GW075126 was identified as a monitoring bore, no SWL was recorded; • GW110572 was identified as a monitoring bore, no SWL was recorded; • GW110573 was identified as a monitoring bore, no SWL was recorded; • GW075129 was identified as a monitoring bore, no SWL was recorded; and • GW100011 was identified as a recreational bore, with a SWL of 7.00 m bgl. The registry was checked on 11 April 2022 and no additional registered bores within 1 km. The anticipated groundwater flow direction is to the south or south-east towards the Nepean River.

6. Previous Reports and Site History

6.1 Summary of Site History

DP (2014 and DP 2022) identified that the site has been used as a market garden/open space until sometime during the 1960s or 1970s. A church (Emu Plains Uniting Church) has been present on the eastern portion of the site since the early 1800s. The site was developed for aged care sometime during the 1970s.

The north-eastern corner of the aged care facility (outside the current investigation area) but within the Lot Boundary was demolished and redeveloped in 2020.

The eastern portion of the site was demolished in late 2021 and early 2022 and is currently in the process of being redeveloped for an on-grade carpark. Based on the aerial photographs it appears that following demolition of the buildings in this area that fill may have been imported to raise and level the proposed car park area.

With regards to 6 to 8 Troy Street, the properties were market gardens (orchards) until the 1960s or 1970s before being redeveloped as residential (houses). 8 Troy Street is still residential whilst 6 Troy Street was repurposed as the administration office of the aged care facility in the 2010s.

6.2 DP (2014)

DP (2014) was of a preliminary site investigation (PSI) for contamination undertaken for a proposed redevelopment of an existing aged care facility at 1 - 11 Emerald Street, Emu Plains NSW (the 'Site'). The investigation did not include 6-8 Troy Street. The investigation boundary of DP (2014) is presented on Drawing 1, Appendix A.

The objectives of the PSI were to assess the potential for contamination of the site based on past and present site uses, provide preliminary soil contamination information, and to comment on the need for further investigation and/or management of contamination (if required).

The site history assessment is included in Section 6 of this report as part of a broader site history assessment of the current investigation area.

The potential sources of contamination at the site were identified as fill (likely to be minimal), asbestos and lead paint used in construction materials, and possible pesticides used throughout landscaped and former market gardening areas. The PSI (DP, 2014) concluded that overall, there appeared to be a low potential for contamination across the site.

DP, 2014 included a total of eight (8) bores which were drilled systematically across the accessible areas of the site in order to recover soil samples for chemical testing. Soil samples were tested for:

- Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, zinc);
- Total recoverable hydrocarbons (TRH);
- Monocyclic aromatic hydrocarbons (benzene, ethylbenzene, toluene, xylenes [BTEX]);
- Polycyclic aromatic hydrocarbons (PAH);

- Phenols;
- Volatile organic compounds (VOC);
- Organochlorine pesticides (OCP); and
- Asbestos.

All results for the soil analysis were within the adopted site assessment criteria (SAC, residential with accessible soils (HILA)). One location (BH3/0.2) had a detectable level of TPH C16-34 and C34-40 but was within the adopted SAC. No ACM or fibres in soil were found during the investigation.

The results of testing from DP (2014) are included in the summary tables G1 and G2 in Appendix G and the borehole logs are include in Appendix D.

The PSI consisted of a limited sampling programme and did not include sample points within the footprints of the existing buildings. Prior to any redevelopment works it was recommended that a Detailed Site Investigation (DSI) be undertaken following the demolition of the existing buildings. The objective of the DSI would be primarily to assess post-demolition surface conditions (e.g., presence of asbestos) and to more comprehensively assess the nature of the fill beneath the buildings.

It was concluded that the site is suitable for continued use as a residential aged care facility and would be suitable for the proposed development subject to implementation of the above recommendation.

6.3 JBS&G (2019)

JBS&G (2019) was a detailed site investigation undertaken for the Stage 1 and Stage 2 redevelopment works at the property. Stage 1 and Stage 2 works comprised:

- Stage 1: Demolition of nursing home, Block D of the hostel and the fellowship centre and construction of a new multistorey nursing home building in the north-east portion of Lot 10. At the time of the current investigation this work has been completed and the new facility completed.
- Stage 2: Demolition of Block E, hostel and construction of a new on grade carpark. At the time of the current investigation the demolition of Block E had been completed and subgrade and the substantial portion of the earthworks for new carpark pavement had been completed.

The investigation boundary and test locations are presented on Drawing 1, Appendix A.

The investigation included a review of DP (2014) and the drilling of 17 additional bores. Fill was present to a depth of between 0.5 to 2.1 m bgl across the JBS&G investigation site. No staining or odours or asbestos containing materials (ACM) were observed in the boreholes. With respect to the Stage 2 area (the currently under construction car park) which is within the current investigation boundary the depth of fill ranged from 0.4 to 0.9 m.

Soil samples were tested for metals, TRH, PAH, OCP, PCB, BTEX and asbestos. No contaminants exceeded the adopted health based or ecological assessment criteria. The report concluded that there was no unacceptable human health or ecological risk with respect to current or proposed future use and that no remediation and / or management of contamination was required.

The results of testing from JBS&G (2019) are included in the summary tables G1 and G2 in Appendix G and the borehole logs are include in Appendix D.

The report recommended that a detailed site clearance inspection be undertaken, and a clearance certificate be prepared by an appropriately qualified person following each stage of demolition to confirm the findings of the investigation. The oversight of asbestos removal works was documented in (JBS&G, 2021) which is summarised in Section 6.6.

Figure 4: JBS&G Investigation Area. Stage 1 area grey shading, Stage 2 area pink shading.

6.4 DP (2022)

DP (2022) was a preliminary site investigation for the Stage 2 site area. The investigation was a desktop review of site history (refer to Section 6.1) a review of previous reports available (refer to Section 6.2 and 6.3), a site inspection (refer to Section 4) and preparation of a conceptual site model (refer to Section 7).

DP (2022) concluded that the risk of significant contamination at the site is low. At the time that the PSI (and DSI) was undertaken construction of the new carpark in the eastern portion of the site was on-going (the buildings had been demolished and fill / subgrade had been imported and compacted with the laying of the pavement imminent. JBS&G (2019) recommended that a detailed site clearance inspection be undertaken, and clearance certificate be prepared by an appropriately qualified person

following each stage of demolition to confirm the findings of the investigation. The records which were made available to DP are summarised in Sections 6.5 and 6.6.

It was further noted that DP was only provided limited access to drill boreholes (for the concurrent DSI) within the under-construction car park and the condition of that part of the site, post demolition, could therefore not be fully assessed. It is DP's understanding that following demolition and removal of the buildings that minimal (if any) soil excavation was undertaken and then material (subgrade material) imported to raise and level the area of the proposed car park over the existing site fill (from the site described in Section 6.5).

Therefore, it was recommended that the post demolition clearance certificate (if available) for the Stage 1 and Stage 2 Areas be provided, along with any documentation pertaining to the waste classification and export of fill prior to the current site formation (if any soil material was exported) and that certificates are also provided for any fill / subgrade materials imported to the site for construction of the carpark.

Following the above recommendations additional information was subsequently provided (refer to Section 6.5 and 6.6).

6.5 EI Australia 2021

DP was provided with a Waste Classification Certificate, (EI Australia, 2021), *Waste Classification Certificate, 219-223 Maroubra Road, Maroubra NSW.* Document E24358.E.05 dated 11 September 2021. It is DPs understanding that the material described in this report is the material which was imported to the site to form the subgrade of the car park.

EI (2020) states that the source site of this material was commercial (retail) and residential land and that a dry cleaner operated at the site until 1988 and a auotmotove garage prior to 1962. The report provides the results of validation samples collected at surface of exposed sand and sandstone (following the removal of overlying fill) described as:

A total of 8 samples were analysed for heavy metals, PAH, BTEX, TRH, OCP, OPP and PCB and 12 samples for asbestos. The results of heavy metals were within typical background ranges and all other tested analytes were below the laboratory detection limits. Based on the results EI Australia classified the material as virgin excvated natural material (VENM).

Based on the history of the site as a dry cleaner, and the absence of validation samples for volatile organic compounds (VOC) which would include the common dry cleaning solvents, DP would recommend requesting further information in regard to the nature dry cleaner related contamination (and remediation) works, if any, that were identified / undertaken to further assess the potential risks associated with material imported from this source site.

6.6 JBS&G 2021

In response to the request for post demolition clearance certificates as recommended in JBS (2019) DP was provided report (JBS&G, 2021) *Oversight of Asbestos Management Works, Stage 2 Redevelopment, Uniting Edinglassie Residential Aged Care Facility, 1-11 Emerald Street, Emu Plains.* Report 61859/142513 dated 13 December 2021.

This report details a number of asbestos finds during demoltion works for Stage 2 building at the site. The report concluded that based on the available information the asbestos removal works (where as asbestos was identified) was undertaken in accordance the agreed asbestos removal methodology.

7. Preliminary Conceptual Site Model

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

Based on the current investigation, the following potential sources of contamination and associated contaminants of potential concern (COPC) have been identified (Table 1).

Table 1: Potential Contamination Sources and COPC

Potential Source	Description of Potential Contaminating Activity	COPC
Imported fill of unknown origin	Fill may have been used for site levelling and landscaping, to backfill swimming pools and was encountered to shallow depths in previous boreholes. It appears that fill may have also recently (late 2021 / early 2022) been imported to the Stage 2 car park area.	Common contaminants associated with fill are metals, TRH, BTEX, PAH, PCB, OCP, OPP, phenol and asbestos.
Building Materials	Based on the age of the buildings it is possible that hazardous materials such as asbestos containing materials (ACM) and lead paint may be present. Building wastes from recent demolition activities may be present below imported subgrade materials beneath the under-construction car park.	Asbestos, lead, OCP, PCB, SMF.

Potential Source	Description of Potential Contaminating Activity	COPC
Market gardens, orchards, grounds and garden maintenance	Pesticides and herbicides may have historically and currently been used on landscaped areas across the site, and during the market gardening period.	OCP, OPP, metals.
Substation	The substation has the potential to contain PCBs.	PCBs, TRH.
Chemical stores	The sort of chemicals used across the site is unknown, however it is noted that chemical stores exist within the grounds. Chemicals are most likely to be fuels and cleaning agents.	Actual chemicals stored are unknown, assume may be caustic in nature for cleaning purposes. TRH, BTEX, PAH, VOC.

The identified potential contamination sources (S) are represented as follows:

S1 Fill

S2 Building materials

S3 Pesticide application

S4 Substation

S5 Chemicals / fuels

7.1 Potential Receptors

7.1.1 Human Health Receptors

R1 - Current site users (workers, visitors and residents of aged care facility)

R2 - Construction and maintenance workers

R3 - Final end users (workers, visitors and residents of aged care facility)

R4 - Land users in adjacent areas (residential and commercial)

7.1.2 Environmental Receptors

R5 - Groundwater

R6 - Surface water (urban canals draining to the Nepean River)

R7 - Ecology

7.2 Potential Pathways

Potential pathways for contamination include the following:

P1 - Direct contact with soil (ingestion and dermal)

P2 - Inhalation of dust and / or vapours

P3 - Leaching of contaminants and vertical migration into groundwater

P4 - Surface water runoff

P5 - Lateral migration of groundwater

P6 - Direct contact with groundwater (ingestion and dermal)

7.3 Summary of Preliminary CSM

A 'source-pathway-receptor' approach has been used to assess the potential risks of harm being caused to human, water or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways. The possible pathways between the above sources (S1 to S5) and receptors (R1 to R7) are provided in Table 2 below.

Table 2: Preliminary Conceptual Site Model

Source	Transport Pathway	Receptor	Risk Management Action Recommended
S1: Fill Metals, TRH, BTEX, PAH, PCB, OCP, OPP, phenol and asbestos **S2: Building Materials** Asbestos, lead, OCP, PCB, SMF **S3: Pesticides** OCP, OPP, metals **S4: Substation** PCBs, TRH	P1: Direct contact with soil (ingestion and dermal)	R1: Current site users R2: Construction and maintenance workers R3: Future users R7: Ecology	An intrusive investigation is required to quantify and characterise possible contamination including chemical testing of the soils. Obtain post demolition clearance certificates for Stage 2 area and imported material certificates for fill imported for under construction car park.
	P2: Inhalation of dust and vapours	R1: Current site users R2: Construction and maintenance workers R3: Future users R4: Adjacent land users	An intrusive investigation is required to quantify and characterise possible contamination including chemical testing of the soils and groundwater. Construction also needs to be carried out with minimal dust generation.

Source	Transport Pathway	Receptor	Risk Management Action Recommended
S5: Chemicals and Fuels TRH, BTEX, PAH, VOC	P3: Leaching of contaminants and vertical migration into groundwater	R5: groundwater R6: surface water R7: ecology	An investigation is required to ascertain the actual presence of a source and potential for vertical migration (i.e., soil properties).
	P4: Surface water runoff	R6: surface water R7: ecology	An investigation is required to assess the potential for surface water to contain contaminants.
	P5: Lateral migration to groundwater	R5: groundwater R7: ecology	An investigation is required to ascertain the actual presence of a source and potential for vertical migration (i.e., soil properties).
	P6: Direct contact with groundwater	R2: Construction and maintenance workers R3: Future users R4: Adjacent land users R7: Ecology	An investigation is required to assess whether groundwater at the site is or has the potential to become contaminated.

8. Sampling and Analysis Quality Plan

8.1 Data Quality Objectives

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

8.2 Soil Sampling Rationale

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

NSW EPA Sampling Design Guidelines (1995) recommends, for a site of between 1.4 and 1.5 hectares, a minimum of 25 systematic test locations. The previous DP and JBS&G investigations included a total of 12 test locations within the current investigation area. The current investigation includes a total of 16 test locations (BH100 to BH105, combined geotechnical and contamination boreholes and BH107 to BH116, environmental boreholes) which exceeds the minimum sampling requirements to the extent practical with respect to the accessible areas of the site.

It is noted that JBS&G test locations were drilled prior to the demolition of the former aged care facility building. Following the demolition of the building asbestos removal works were undertaken as documented in (JBS&G, 2021) and subgrade imported to the site to form the base of the car park pavement (the reported source of the subgrade material is documented in (EI Australia, 2021). The current investigation was completed after the demolition works and import of the subgrade material

Borehole locations are shown on Drawing 1, in Appendix A.

The following borehole locations were positioned to provide general coverage and target specific areas of concern.

Borehole BH113	Adjacent to the site workshop
Borehole BH116	Adjacent to the site substation
Borehole BH104, BH104 and BH116	Within the footprint of the proposed carpark where subgrade material was been imported from source site described in (EI Australia, 2021)

Soil samples were collected from each borehole at depths of approximately 0.15 m, 0.5 m, 1.0 m and every 0.5 m thereafter, and changes in lithology or signs of contamination.

Soil sampling methods are described in the field work methodology, included in Appendix D.

8.3 Groundwater Sampling Rationale

In order to assess the current groundwater contamination status at the site and evaluate whether historical / current / off site land uses have impacted on groundwater, sampling from three monitoring wells (BH100 and BH102) was undertaken. It is noted the potential risk of groundwater contamination was generally assessed to be low and the positioning of the groundwater wells was determined (in part) based on site accessibility and geotechnical considerations. BH100 was located on the western site boundary (in an area which was historically market gardens / orchards and BH102 was located in an area that was also historically market gardens and positioned on the upgradient (northern) site boundary downgradient of commercial properties situated to the north of the site. The groundwater wells were situated to assess the general water quality at the site.

Groundwater sampling methods are described in the field work methodology, included in Appendix D.

9. Site Assessment Criteria

The Site Assessment Criteria (SAC) applied in the current investigation are informed by the CSM (Section 7) 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 proposed development shall include continued operation of the site as a aged care facility. Therefore, investigation and screening levels applied in the current investigation comprise levels adopted for a generic residential land use scenario with accessible soils. The derivation of the SAC is included in Appendix E and the adopted SAC are listed on the summary analytical results tables in Appendix E.

10. Results

10.1 Field Work Results

The subsurface conditions encountered in the boreholes are presented in the borehole logs in Appendix F together with notes defining classification methods and descriptive terms.

A summary of the typical sequence of subsurface conditions encountered in the geotechnical boreholes BH100 to BH105 & BH107 to BH116 at the site is presented below:

Fill:	Encountered in all DP boreholes to between 0.4 m to 1.5 m thick. Variable material and consistency, typically a grey, black or brown clay, silty / clayey or gravelly sand material, loose to medium dense. Refusal in fill was encountered in Boreholes BH108, BH109, BH111-BH113, BH115 and BH116 due to the method of drilling (hand tools).
Alluvial Sediments:	Encountered in all boreholes BH100 to BH105, BH107, BH110, BH114 beneath the fill. Interbedded layers of stiff silty clay, sandy clay and loose to dense sand, silty or clayey sand. There was an overall increase in gravel percentage and soil strength with depth. Boreholes BH100 to BH105 refused on inferred fine to coarse river gravels between depths of 4.3 m and 8.55 m bgl. Boreholes BH107, BH110 and BH114 were terminated due to hand auger refusal

There were no other apparent records of visual or olfactory evidence (e.g., staining, odours, free phase product) to suggest the presence of contamination within the soils or groundwater observed in the investigation. It is noted that bricks have been observed in the fill in some locations during previous investigations (BH5A/5B and BH8 in DP 2014 and JBS BH117).

The PID screening indicated that the sub-surface conditions were generally absent of VOC with all recorded values of less than 1 ppm.

Groundwater was observed whilst drilling the following boreholes:

- BH100 (at the ground surface, possibly due to ponded water);
- BH102 (2.0 m bgl / RL 26.2 m AHD); and
- BH105 (2.5 m bgl / RL 24.0 m AHD).

No free groundwater was observed during the auger drilling in the remaining boreholes.

It should be noted that groundwater levels are affected by climatic conditions and soil permeability and will therefore vary with time.

Groundwater levels were gauged on 16 March 2022 using an electronic oil / water interface meter prior to developing the wells and again on 23 March 2022 prior to sampling. The measured water levels prior to sampling are shown in Table 3.

Table 3: Summary of Groundwater Level Measurements on 23 March 2022

Well ID	Location of Monitoring Well	Ground Level * m (AHD)	SWL m (bgl)	SWL m (AHD)
BH100	Western site boundary	28.1	2.00	26.1
BH102	Northern site boundary	28.2	2.30	25.9

Notes:
*Surveyed by dGPS
AHD – Australian Height Datum
SWL – standing water level
bgl – below ground level
^Down-gradient of diesel UST

Based on the groundwater level measurements and the position of the site, groundwater is inferred to be flowing to the south towards the Nepean River.

The stabilised groundwater field parameters recorded prior to sampling are shown on the groundwater field sheets included in Appendix F and summarised below.

Physical parameters were measured whilst sampling (where possible) and are summarised in Table 4.

Table 4: Summary of Field Parameters (Groundwater)

Well / Sample ID	Temp. (ºC)	DO (ppm)	EC (µS/cm)	pH	Turbidity (ntu)	Redox (mV)
BH100	23.5	5.35	332	7.11	4287	122.9
BH102	23.8	2.67	1477	8.07	1109	100.4

The dissolved oxygen levels indicated generally aerobic conditions. The pH was slightly alkaline. Redox potential (Eh) indicates slightly oxidising conditions.

No light non-aqueous phase liquid LNAPL was observed whilst sampling.

10.2 Laboratory Analytical Results

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

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

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

11. Discussion

11.1 Soils

Soil samples were tested for heavy metals, TRH, BTEX, PAH, OCP, OPP, phenols, PFAS and asbestos.

The analytical results for in all samples were below the SAC, including results from the current investigation, DP (2014) and JBS&G (2019) with the exception of:

- TRH, F2 (>C10-C16) less naphthalene in sample BH113 /0-0.2, 120 mg.kg, which exceeded the HSL of 110 mg/kg and TRH, F3 (>C16-C34), 410 mg/kg which exceeded the ESL of 300 mg/kg.

Borehole BH113 is located adjacent to the workshop. The workshop includes storage of dangerous goods (flammable liquids). It is therefore possible that minor spills of the materials stored in the workshop may have occurred in this area.

Given the minor nature of the exceedance the 95% upper confidence limit was calculated using ProUCL[1] the above fractions for the entire data set for both Stage 1 and Stage 2 areas. The 95% UCLs were 53 mg/kg and 115 mg/kg for the F2 (>C10-C16) and F3 (>C16-C34 fractions respectively which is below the HSL/ESL. Therefore, the minor exceedances are not considered to be significant.

It is noted that the proposed development will require demolition of the workshop and basement excavation of part of the workshop footprint (however the excavation does not extend to the location of Borehole BH113. Therefore, as a precautionary measure, it is recommended that following demolition of the workshop that additional investigation / testing be undertaking within the footprint of the workshop and vicinity of Borehole BH113 to (a) confirm the initial result and (b) determine if remedial works in relation to this detection are warranted.

Given the minor exceedance at BH113 a remediation action plan is not considered to be warranted, however an unexpected finds/minor works protocol should be prepared to manage the potential impacts (and other potential contamination finds during demolition and redevelopment works).

[1] For the purpose of calculating a 95% UCL for samples below the detection limit the detection limit was adopted as the sample concentration as a conservative measure as there were not sufficient samples greater than the detection limits to utilise methods with non-detects. The ProUCL outputs are provided in Appendix G.

It is noted that trace pesticides were detected by JBS&G in boreholes JBS BH101 and JBS BH102, however the concentration detected was both within the adopted SAC and outside the current investigation area (i.e., was within the Stage 1 boundary). Aldrin and dieldrin was detected in sample BH109/0.4-0.5 at a concentration of 2.1 mg/kg (within the SAC of 6 mg/kg).

No asbestos was detected during the current investigation. It is noted however that during Stage 1 demolition works a number of asbestos finds were encountered (JBS&G, 2021). Trace brick fragments have also been identified in the fill in some locations across the site. Therefore, it is considered that there is a moderate to high probability that asbestos will be encountered during demolition and / or excavation works. Potential asbestos finds could be managed under an minor works / unexpected finds protocol.

11.2 Groundwater

Groundwater samples were analysed for heavy metals, TRH, BTEX, PAH, total phenols, PFAS, PCB, OCP and OPP.

All results were below the SAC, with the exception of:

- Lead which exceeded the ANZG (2018) freshwater guideline (FWG) of 3.4 µg/L in sample BH100 13 µg/L), BH102 (32 µg/L) and BD1/20220323 (replicate of BH100) 5 µg/L;
- Zinc in sample BH102 which exceeded the FWG of 8 µg/L with a concentration of 13 µg/L; and
- PFOS in samples BH100 (0.003 µg/L) and BH102 (0.015 µg/L) above the 99% level or protection (LOP) of 0.00023 µg/L. It is noted that PFOS was below the 95% LOP (0.13 µg/L) and given the distance to nearest sensitive ecological receptor (The Nepean River, approximately 750 m south of the site) and the absence of a significant potential source of PFAS contamination identified in the CSM the low levels of PFAS detected in groundwater are not considered to be significant or to warrant remediation.

With regard to heavy metal exceedances, based on our experience in the area, the concentrations of metals in groundwater are considered likely to be attributed to the background concentrations that may be attributable to local mineralogy and / or urban runoff.

The concentration of BTEX, OCP, OPP, phenols and PCBs were below detection limits. Low levels of TRH were detected for a number of TRH fractions (total C10-C40 390 µg/L) in replicate sample of BH100 (BD1/20220323) and in the C16-C34 fraction in sample BH102 (120 µg/L). It is noted that in the primary sample the laboratory reporting limit was raised due to interference from analytes other than those being analysed such that the reporting limit in the primary sample was higher than the concentration detected in the replicate sample (or marginally lower than the detected concentration) and therefore the repeatability of the detected TRH levels cannot be assessed. Notwithstanding, the concentration of TRH was below the adopted HSL (where available). During drilling free groundwater water was noted at the surface due to ponding (following heavy rainfall). It is considered possible that in the absence of any identified potential source of TRH in groundwater that that the slightly elevated TRH concentration may be related to this ponded water. A supplementary round of groundwater monitoring would be prudent to determine if the TRH is persistent and / or the result of cross-contamination with the ponded (surface) water.

11.3 Preliminary Waste Classification

11.3.1 Fill Soils

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 bores; 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 material, 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 G3, Appendix G (attached).
6. Is the waste putrescible or non-putrescible?	Putrescible / Non-putrescible	The fill does not contain materials considered to be putrescible [a].

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

As shown in the Table G3, Appendix G, all contaminant concentrations within the fill (as described in Section 10.1) were within the criteria for General Solid Waste (non putrescible) as defined in NSW EPA (2014).

Aldrin + dieldrin were detected in sample BH109/0.4-0.5 at a concentration of 2.1 mg/kg. Aldrin and dieldrin are scheduled chemical wastes as defined in (NSW EPA, 2004) Scheduled Chemical Wastes Chemical Control Order 2004. EPA 2004 defines scheduled chemical wastes *as any liquid or solid waste that contains one or more of the chemicals listed in Schedule A to this chemical control order where the total concentration of those chemicals is more than two milligrams per kilogram.* DP recommends that further testing be undertaken in the vicinity of BH109 during bulk excavation to determine if OCP in fill in this area exceeds 2 mg/kg and therefore if the fill is considered to be scheduled chemical waste. Scheduled chemical waste must be handled and disposed in accordance with the requirements of EPA 2004.

As noted in Section 11.1 there is a moderate to high potential that asbestos will be encountered during demolition and / or excavation. Materials which contain asbestos would be classified, as a minimum, as Special Waste (asbestos).

11.3.2 Natural Soils

The following Table 6 presents the results of the assessment of natural soils (refer to descriptions in Section 10.1 and borehole Logs in Appendix D) at the site with reference to the VENM definition in the POEO Act and the EPA[2] website.

Table 6: VENM Classification Procedure

Item	Comments	Rationale
1. Is the material natural?	Yes	Natural materials logged in the boreholes (refer to Section 10.1 and the borehole logs in Appendix D. These materials underlie the fill at the site.
2. Is the material impacted by manufactured chemicals or process residues?	No	There were no visual indicators of chemical contamination of the materials in the test pits. Concentrations of contaminants were considered to be typical of background concentrations (Table G3, Appendix G).
3. Are the materials acid sulphate soils?	No	A review of the published mapping shows the site in an area of no ASS occurrence.
4. Are there current or previous land uses that have (or may have) contaminated the 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 the Table G3, Appendix G all heavy concentrations for the analysed natural soil samples were within the typical background concentrations. The concentration of TRH, BTEX, PAH, OCP, OPP, PCB and phenols were below the laboratory detection limits. Based on the outcomes presented in Table 3, the natural soils and bedrock described in Section 10.1 within the area subject to assessment as shown on Drawing 1, Appendix A are classified as VENM.

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

If during excavation the natural in situ soil is found to contain possible signs of contamination or is cross-contaminated with non-VENM materials, the excavated natural soil cannot be classified as VENM. In this regard, it is also recommended that care should be taken during the bulk excavation of the VENM to prevent cross contamination between the VENM and non-VENM materials. The classification of the natural soils must be confirmed following the removal of the overlying fill.

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

Note that appropriate prior arrangement with the receiving site/relevant authorities should be obtained prior to the disposal of any material off site. The receiving site should check to ensure that the material received is suitable for the proposed use, matches the description provided in this report and contains no cross contamination. The receiving site should also check any acceptability restrictions specific to the receiving site such as salinity, ecological requirements.

11.4 Data Quality Assurance and Quality Control

The data quality assurance and quality control (QA / QC) results are included in Appendix I. 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. Conclusions and Recommendations

Based on the results of the DSI it is considered that the site can be made suitable for the proposed residential (aged care facility) development subject to implementation of the recommendations below.

- Further investigation of the nature and extent of TRH impacts in soil at BH113 following the demolition of the workshop. It the presence of TRH above the SAC is confirmed the management of the soils can be undertaken under an unexpected finds/minor works protocol;
- A supplementary round of groundwater sampling to confirm the presence (or otherwise) of TRH in groundwater;
- Further waste classification assessment within the building footprints and the footprint of the temporary carpark (where materials have been imported from the site described in JBS&G (2021) following demolition of the existing structures and the temporary carpark;
- Further waste classification assessment in the vicinity of BH109 to confirm the presence or otherwise of scheduled chemical waste. Note: this is not considered a requirement to make the site suitable, rather a recommendation to determine if the requirements of (NSW EPA, 2004) need apply should off-site disposal of the material to a suitably licensed landfill be contemplated;
- It is recommended that further information be sought on the source (site) of the imported material which is described in (EI Australia, 2021). Specifically in regard to the site history indicating that a dry cleaner was present at that site and to further assess the risk (or otherwise) related to that material;
- Preparation of clearance certificate by an appropriately qualified person following each stage of demolition to confirm the findings of the investigation; and
- Preparation of an unexpected finds / protocol.

13. References

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

DP. (2014). *Report on Preliminary Site Investigation, Proposed Aged Care Facility, 1-11 Emerald Street, Emu Plains.* Project 84503.R.001.Rev0, 6 November 2014: Douglas Partners Pty Ltd.

DP. (2022). *Report on Preliminary Site Investigation (Contamination), Proposed Aged Care Facility, Endinglassie Village, Part 1-3 Emerald and 6-8 Troy Street, Emu Plains .* Project 84503.02.R.001.Rev0: Douglas Partners Pty Ltd.

EI Australia. (2021). *Waste Classification Certificate, 219-223 Maroubra Road, Maroubra NSW.* Document E24358.E.05 dated 11 September 2021: Ei Australia.

JBS&G. (2019). *Detailed Site Investigation, 1-11 Emerald Street, Emu Plains NSW.* Project 55566/120590 (rev1), 11 February 2019: JBS&G Pty Ltd.

JBS&G. (2021). *Oversight of Asbestos Management Works, Stage 2 Redevelopment, Uniting Edinglassiem Residential Aged Care Facility, 1-11 Emerald Street, Emu Plains.* Report 61859/142513 dated 13 December 2021: JBS&G Pty Ltd.

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

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

NSW EPA. (2004). Scheduled Chemical Wastes Chemical Control Order 2004.

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

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

14. Limitations

Douglas Partners (DP) has prepared this report (or services) for this project at Part 1-3 Emerald Street and 6-8 Troy Street, Emu Plains in accordance with DP's proposal dated 16 February 2022 and acceptance received from The Uniting Church in Australia Property Trust for Uniting (NSW.ACT). The work was carried out in accordance with the consultancy agreement with The Uniting Church in Australia Property Trust for Uniting (NSW.ACT). This report is provided for the exclusive use of The Uniting Church in Australia Property Trust for Uniting (NSW.ACT) for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

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

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

DP personnel are not licenced or accredited surveyors. Any quantities quoted in this report are provided for general guidance only and should not be relied upon. The services of a licenced/accredited surveyor should be engaged if reliable quantities are required.

Asbestos has not been detected by observation or by laboratory analysis in the current investigation. Fill soils are present throughout the site, bricks have been observed in the fill in some locations and asbestos has been encountered during previous demolition works and this is considered as indicative of the possible presence of hazardous building materials (HBM), including asbestos.

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.

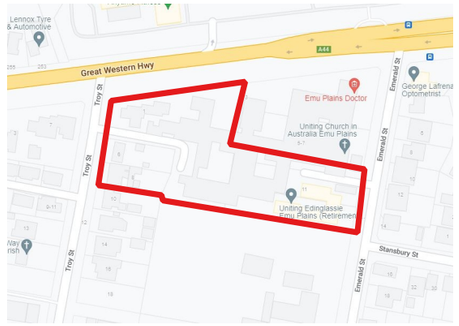
This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation,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

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

Douglas Partners Pty Ltd

Appendix A

Drawings



LOCALITY MAP

Notes:
1. Basemap from metromap.com (dated 01/06/2014)
2. Test locations shown are approximate only

Legend

Site Boundary
- Investigation Boundary
- Proposed Basement Outline

DP 2022 Borehole Locations
- Environmental Borehole
- Geotechnical and Environmental Borehole
- Groundwater Monitoring Well

- DP 2014 Boreholes
- JBS 2019 Test Locations
- Stage 1 Boundary
- JBS&G 2019 Investigation Boundary
- DP 2014 Investigation Boundary
- Work Shop
- Substation
- New Carpark (under construction)

0 25 50 75 m

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT:	The Uniting Church in Australia		
OFFICE:	Sydney	DRAWN BY:	KDP
SCALE:	1:1000 @ A3	DATE:	10.05.2022

TITLE: **Site Layout and Test Locations**
Proposed Aged Care Facility
1-3 Emerald Street and 6-8 Troy Street, Emu Plains

N

PROJECT No:	84503.02
DRAWING No:	1
REVISION:	0

MASTER PLAN - GROUND FLOOR

BLD	A	B	C	D	E
GBA (m2)	3821	2968	3644	3605	2586
TOTAL (m2)	16624				
128 APARTMENTS (29 3BED, 69 2BED, 30 1BED)					

Uniting Edinglassie
For: Uniting Care

BUILDING A, B, C : 86 APARTMENTS
(19 3BED, 40 2BED, 11 1BED, 16 AFF.H)

BUILDING D & E : 58 APARTMENTS
(5 3BED, 21 2BED, 11 1BED, 21 AFF.H)

TOTAL: 144 APARTMENTS
(24 3BED, 61 2BED, 22 1BED, 37 AFF.H)

REQUIRED PARKING:

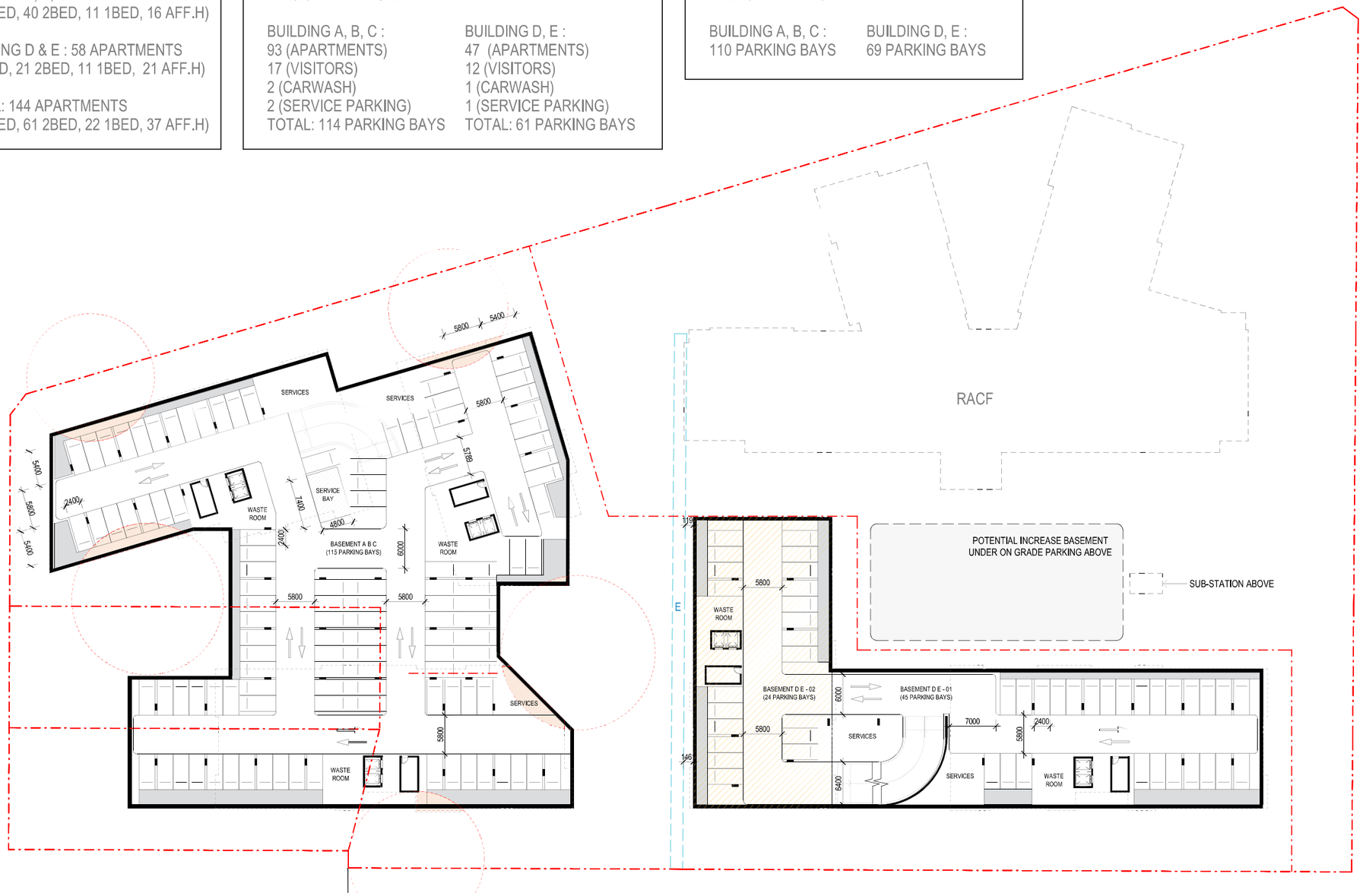
BUILDING A, B, C :	BUILDING D, E :
93 (APARTMENTS)	47 (APARTMENTS)
17 (VISITORS)	12 (VISITORS)
2 (CARWASH)	1 (CARWASH)
2 (SERVICE PARKING)	1 (SERVICE PARKING)
TOTAL: 114 PARKING BAYS	TOTAL: 61 PARKING BAYS

PROVIDED PARKING:

BUILDING A, B, C :	BUILDING D, E :
110 PARKING BAYS	69 PARKING BAYS

LEGEND

- TPZ
- ENCROACHMENT INTO TPZ
- BUILDING ABOVE



1 BASEMENT
1 : 350

North Point

NOTE: HARDCOPIES OF THIS DRAWING TO BE PRINTED IN COLOUR

Amendments

Issue	Description	Date
A	FOR INFORMATION	16.12.21
B	FOR INFORMATION	17.12.21
C	FOR INFORMATION	20.12.21
D	FOR INFORMATION	27.04.22

Amendments

Issue	Description	Date

Consultant
Consultant Company[details]

Consultant
Consultant Company[details]

Consultant
Consultant Company[details]

Client
UNITING EDINGLASSIE
Client Details

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architecture interior design urban design landscape
nsw architect Lisa-Maree Carrigan 7568

Project Title
UNITING EDINGLASSIE

Drawing Title
BASEMENT

PRELIMINARY

27/04/2022 5:36:36 PM

Plotted and checked by	Author		
Verified	Designer	Approved	Approver
Drawing Created (date)		Drawing Created (by)	Checker
			10/26/21

Scale	Project No	Drawing No	Issue
1 : 350	Job No.	SK2002	D

Appendix B

About this Report

About this Report

Douglas Partners

Introduction

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

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

Copyright

Borehole and Test Pit Logs

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

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

Groundwater

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

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

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

Reports

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

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

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

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

About this Report

Site Anomalies

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

Information for Contractual Purposes

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

Site Inspection

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

Appendix C

Data Quality Objectives

Appendix C
Data Quality Objectives
1-3 Emerald Street and 6-8 Troy Street, Emu Plains

C1.0 Data Quality Objectives

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

Step	Summary
1: State the problem	The objective of the investigation is to confirm the contamination status of the site with respect to the proposed land use. The report is being undertaken as the land is to be redeveloped for continued use as a aged care facility. on our recent experience with Council on similar sites. A preliminary conceptual site model (CSM) has been prepared (Section 7) 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, 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 7). 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 E. The decision is to establish whether or not the results fall below the SAC. On this basis, an assessment of the site's suitability from a contamination perspective and whether (or not) further assessment and / or remediation will be derived.
3: Identify the information inputs	Inputs to the investigation will be the results of analysis of samples to measure the concentrations of COPC identified in the CSM (Section 7) at the site using NATA accredited laboratories and methods, where possible. The SAC for each of the COPC are detailed in Appendix E. A photoionization detector (PID) was used on-site to screen soils for 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 12.

Step	Summary
5: Develop the analytical approach (or decision rule)	The decision rule is to compare all analytical results with SAC (Appendix E, 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). Quality control results are to be assessed according to their relative percent difference (RPD) values. For field duplicates, triplicates and laboratory results, RPDs should generally be below 30%; for field blanks and rinsates, results should be at or less than the limits of reporting (NEPC, 2013). The field and laboratory quality assurance assessment is included in Appendix I.
6: Specify the performance or acceptance criteria	Baseline condition: Contaminants at the site exceed human health and environmental SAC and pose a potentially unacceptable risk to receptors (null hypothesis). Alternative condition: Contaminants at the site comply with human health and environmental SAC and as such, do not pose a potentially unacceptable risk to receptors (alternative hypothesis). Unless conclusive information from the collected data is sufficient to reject the null hypothesis, it is assumed that the baseline condition is true.
7: Optimise the design for obtaining data	As the purpose of the sampling program is to assess for potential contamination across the site, the sampling program is reliant on professional judgement to identify and sample the potentially affected areas. Further details regarding the proposed sampling plan are presented in Section 8.

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.

Douglas Partners Pty Ltd

Appendix D

Fieldwork Results

BOREHOLE LOG

CLIENT: Uniting Care Ageing
PROJECT: Proposed Aged Care Facility
LOCATION: Emerald Street, Emu Plains

SURFACE LEVEL: 26.8*
EASTING: 283146
NORTHING: 6262605
DIP/AZIMUTH: 90°/--

BORE No: BH1
PROJECT No: 84503
DATE: 26/9/2014
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.05	ASPHALTIC CONCRETE							
	0.3	FILLING - brown, silty, fine to coarse sand filling with trace basalt gravel, humid		E/D	0.2		PID<1		
		SILTY CLAY - very stiff, red silty clay with trace fine to medium sand (MC<<PL)			0.5				
				E/D			PID<1		
1					1.0				1
				S			8,13,15 N = 28		
	1.45								
	1.8	SILTY SAND - medium dense, red-brown, slightly clayey, silty, fine to medium sand, damp							
2									2
					2.5				
				S			4,6,10 N = 16 PID<1		
3					2.95				3
					4.0				
4				S			10,17,18 N = 35 PID<1		4
	4.4	SILTY SANDY CLAY - hard, brown, silty sandy clay (MC<<PL)			4.45				
5	5.2	Bore discontinued at 5.2m - refusal on river gravel							5
6									6
7									7
8									8
9									9

RIG: DT 100 **DRILLER:** SS **LOGGED:** JE **CASING:** Uncased

TYPE OF BORING: Auger to termination

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Surface levels interpolated from Vince Morgan Surveyors Drawing No. 16582T2 dated 20 June 2014

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Uniting Care Ageing
PROJECT: Proposed Aged Care Facility
LOCATION: Emerald Street, Emu Plains

SURFACE LEVEL: 26.4**
EASTING: 283006
NORTHING: 6262595
DIP/AZIMUTH: 90°/--

BORE No: BH2
PROJECT No: 84503
DATE: 26/9/2014
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.05	ASPHALTIC CONCRETE		E/D	0.0		PID<1		
	0.3	FILLING - grey, silty, fine to medium sand with trace fine to medium basalt gravel, humid			0.2				
	0.7	FILLING - grey, gravelly clay filling, fine to medium angular shale gravel (MC<<PL)		E/D	0.5		PID<1		
	1	SAND - dense, light grey, fine to medium sand with trace silt, humid		E/D S*	1.0		PID<1 8/20mm refusal		
	1.9	CLAYEY SAND - dense, orange-brown, slightly silty, clayey fine to medium sand, damp		S	2.5		25/100mm refusal PID<1		
	3.7	Bore discontinued at 3.7m - refusal on river gravel							

RIG: DT 100 **DRILLER:** SS **LOGGED:** JE **CASING:** Uncased

TYPE OF BORING: Auger to termination

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *SPT aborted, concern over services; ** Surface levels interpolated from Vince Morgan Surveyors Drawing No. 16582T2 dated 20 June 2014

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Uniting Care Ageing
PROJECT: Proposed Aged Care Facility
LOCATION: Emerald Street, Emu Plains

SURFACE LEVEL: 27.0*
EASTING: 283155
NORTHING: 6262667
DIP/AZIMUTH: 90°/--

BORE No: BH3
PROJECT No: 84503
DATE: 26/9/2014
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.15	FILLING - brown, sandy silt (topsoil) with bark and rootlets		E	0.1		PID<1		
				E	0.15		PID<1		
	0.4	FILLING - light orange-brown, silty sand with trace clay and sticks (<5cm length) (possibly reworked natural)			0.2				
				E	0.25		PID<1		
	0.7	SILTY SAND - light orange-brown, silty sand with trace of clay and ironstone gravel		E	0.5				
		Bore discontinued at 0.7m - refusal on tree root			0.6				

RIG: Hand tools **DRILLER:** JAL **LOGGED:** JAL **CASING:** Uncased

TYPE OF BORING: Hand auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Surface levels interpolated from Vince Morgan Surveyors Drawing No. 16582T2 dated 20 June 2014

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Uniting Care Ageing
PROJECT: Proposed Aged Care Facility
LOCATION: Emerald Street, Emu Plains

SURFACE LEVEL: 26.8**
EASTING: 283083
NORTHING: 6262650
DIP/AZIMUTH: 90°/--

BORE No: BH4
PROJECT No: 84503
DATE: 26/9/2014
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.1	FILLING - brown, sandy silt (topsoil)		E	0.1		PID<1		
	0.4	FILLING - brown, silty clayey sand filling with some sandstone gravel			0.2				
		SILTY CLAYEY SAND - orange-brown, silty, fine to medium clayey sand		E*	0.5		PID<1		
					0.6				
	0.9	- medium to coarse sand at 0.7m		E	0.7		PID<1		
	1	Bore discontinued at 0.9m - target depth reached			0.8				

RIG: Hand tools **DRILLER:** JAL **LOGGED:** JAL **CASING:** Uncased

TYPE OF BORING: Hand auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *BD1/260914; ** Surface levels interpolated from Vince Morgan Surveyors Drawing No. 16582T2 dated 20 June 2014

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: Uniting Care Ageing
PROJECT: Proposed Aged Care Facility
LOCATION: Emerald Street, Emu Plains

SURFACE LEVEL: 26.4*
EASTING: 283052
NORTHING: 6262656
DIP/AZIMUTH: 90°/--

BORE No: BH5A
PROJECT No: 84503
DATE: 26/9/2014
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.05	FILLING - dark brown, sandy silt filling with rootlets							
		FILLING - orange-brown, clayey silty sand filling with some sandstone and shale gravel, quartz and brick fragments		E	0.3		PID<1		
				E	0.4		PID<1		
	0.7				0.5				
	0.9	FILLING - mottled grey-red-brown, sandy clay filling with trace sandstone gravel and wire fragments							
1	1.0	FILLING - brown, gravelly sand filling with trace clay and shale gravel							1
		Bore discontinued at 1.0m - refusal on hard filling							
2									2
3									3
4									4
5									5
6									6
7									7
8									8
9									9

RIG: Hand tools **DRILLER:** JAL **LOGGED:** JAL **CASING:** Uncased

TYPE OF BORING: Hand auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Surface levels interpolated from Vince Morgan Surveyors Drawing No. 16582T2 dated 20 June 2014

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: Uniting Care Ageing
PROJECT: Proposed Aged Care Facility
LOCATION: Emerald Street, Emu Plains

SURFACE LEVEL: 26.3*
EASTING: 283048
NORTHING: 6262658
DIP/AZIMUTH: 90°/--

BORE No: BH5B
PROJECT No: 84503
DATE: 26/9/2014
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.05	FILLING - dark brown, sandy silt filling with rootlets							
	0.4	FILLING - orange-brown, clayey silty sand filling with some sandstone and shale gravel, quartz and brick fragments		E	0.5 0.6		PID<1		
	0.7	FILLING - mottled grey-red-brown, sandy clay filling with some shale gravel and trace brick fragments		E	0.7 0.8		PID<1		
	1.0	CLAYEY SAND - brown, clayey sand with some ironstone and shale gravel							
		Bore discontinued at 1.0m - target depth reached							

RIG: Hand tools **DRILLER:** JAL **LOGGED:** JAL **CASING:** Uncased

TYPE OF BORING: Hand auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Surface levels interpolated from Vince Morgan Surveyors Drawing No. 16582T2 dated 20 June 2014

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: Uniting Care Ageing
PROJECT: Proposed Aged Care Facility
LOCATION: Emerald Street, Emu Plains

SURFACE LEVEL: 26.6**
EASTING: 283075
NORTHING: 6262580
DIP/AZIMUTH: 90°/--

BORE No: BH6
PROJECT No: 84503
DATE: 26/9/2014
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.15	FILLING - brown, sandy silt (topsoil) with traces of rootlets		E	0.0		PID<1		
		SAND - light brown, sand with medium to coarse river gravel (quartz, etc)		E*	0.15 0.3 0.4		PID<1		
	0.8				0.8				
	0.9	SANDY CLAY - brown, sandy clay, moist		E	0.9		PID<1		
		Bore discontinued at 0.9m - target depth reached							

RIG: Hand tools **DRILLER:** JAL **LOGGED:** JAL **CASING:** Uncased

TYPE OF BORING: Hand auger

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *BD2/260914; ** Surface levels interpolated from Vince Morgan Surveyors Drawing No. 16582T2 dated 20 June 2014

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: Uniting Care Ageing
PROJECT: Proposed Aged Care Facility
LOCATION: Emerald Street, Emu Plains

SURFACE LEVEL: 25.9*
EASTING: 283107
NORTHING: 6252681
DIP/AZIMUTH: 90°/--

BORE No: BH7
PROJECT No: 84503
DATE: 26/9/2014
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.1	TOPSOIL - dark brown, silty clay topsoil (MC<PL) (rootlets to 50mm)		E/D	0.2		PID<1		
		SILTY CLAY - light brown-grey, silty clay with some fine to medium sand (MC<<PL)		E/D	0.5				
	1			E/D	1.0				
	1.2	Bore discontinued at 1.2m - at target depth							

RIG: DT 100 **DRILLER:** SS **LOGGED:** JE **CASING:** Uncased

TYPE OF BORING: Auger to termination

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Surface levels interpolated from Vince Morgan Surveyors Drawing No. 16582T2 dated 20 June 2014

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: Uniting Care Ageing
PROJECT: Proposed Aged Care Facility
LOCATION: Emerald Street, Emu Plains

SURFACE LEVEL: 26.5*
EASTING: 282988
NORTHING: 6262665
DIP/AZIMUTH: 90°/--

BORE No: BH8
PROJECT No: 84503
DATE: 26/9/2014
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
	0.1	TOPSOIL - dark brown, silty clay topsoil with some fine to medium sand (MC<PL) (rootlets to 50mm)		E/D	0.2		PID<1		
		FILLING - brown, sandy silty clay filling with trace shale and brick fragments		E/D	0.5		PID<1		
	0.7	SILTY CLAY - stiff, red-brown, silty clay with some fine to medium sand (MC<PL)		E/D	1.0		PID<1		
	1.2	Bore discontinued at 1.2m - at target depth							

RIG: DT 100 **DRILLER:** SS **LOGGED:** JE **CASING:** Uncased

TYPE OF BORING: Auger to termination

WATER OBSERVATIONS: No free groundwater observed

REMARKS: * Surface levels interpolated from Vince Morgan Surveyors Drawing No. 16582T2 dated 20 June 2014

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: United Care Ageing
PROJECT: Edinglassie Village Stage 2
LOCATION: 1 Emerald Street, Emu Plains

SURFACE LEVEL: 28.5
EASTING: 282948
NORTHING: 6262600
DIP/AZIMUTH: 90°/--

BORE No: 107
PROJECT No: 84503.02
DATE: 11/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	VWP Construction Details
		FILL/Clayey SILT: grey-black, trace roots and sandstone gravel		E	0.0		PID<1		
	0.2	FILL/Clayey SILT: grey-brown, wet			0.2				
28				E	0.4		PID<1		
	0.6	Clayey SILT: grey-brown, with fine sand, wet			0.6				
				E	0.8		PID<1		
	1 1.0	Clayey SILT: grey-brown, with fine to medium sand			1.0				1
				E*	1.3		PID<1		
27	1.5	Bore discontinued at 1.5m Target depth reached			1.5				

RIG: Hand Tools **DRILLER:** VV **LOGGED:** VV **CASING:** Nill
TYPE OF BORING: Hand Auger
WATER OBSERVATIONS: No free ground water observed
REMARKS: * Blind Duplicate BD03 taken from 1.3-1.5m

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: United Care Ageing
PROJECT: Edinglassie Village Stage 2
LOCATION: 1 Emerald Street, Emu Plains

SURFACE LEVEL: 28.5
EASTING: 282978
NORTHING: 6262609
DIP/AZIMUTH: 90°/--

BORE No: 108
PROJECT No: 84503.02
DATE: 11/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	VWP Construction Details
		FILL/Clayey SILT: grey-black, with some sandstone gravel, moist		E*	0.0		PID<1		
	0.2	Bore discontinued at 0.2m Hand auger refusal in fill			0.2				
28									
	1								1
27									

RIG: Hand Tools **DRILLER:** VV **LOGGED:** VV **CASING:** Nill
TYPE OF BORING: Hand Auger
WATER OBSERVATIONS: No free ground water observed
REMARKS: * Blind Duplicate BD04 taken from 0-0.2m

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: United Care Ageing
PROJECT: Edinglassie Village Stage 2
LOCATION: 1 Emerald Street, Emu Plains

SURFACE LEVEL: 29.1
EASTING: 282987
NORTHING: 6262645
DIP/AZIMUTH: 90°/--

BORE No: 109
PROJECT No: 84503.02
DATE: 11/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	VWP Construction Details
29		FILL/Clayey SILT: grey-black, moist, with concrete gravel			0.0				
				E			PID<1		
	0.2	FILL/Clayey SILT: grey-black, with concrete gravel			0.2				
					0.4				
				E			PID<1		
	0.5	Bore discontinued at 0.5m Hand auger refusal in fill			0.5				
	1								1
28									

RIG: Hand Tools **DRILLER:** VV **LOGGED:** VV **CASING:** Nill
TYPE OF BORING: Hand Auger
WATER OBSERVATIONS: No free ground water observed
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: United Care Ageing
PROJECT: Edinglassie Village Stage 2
LOCATION: 1 Emerald Street, Emu Plains

SURFACE LEVEL: 28.4
EASTING: 283012
NORTHING:
DIP/AZIMUTH: 90°/--

BORE No: 110
PROJECT No: 84503.02
DATE: 11/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	VWP Construction Details
		FILL/Clayey SILT: grey-black, rootlets, moist		E	0.0		PID<1		
	0.2	CLAY: orange-brown, moist			0.2				
28				E	0.4		PID<1		
	0.5	Bore discontinued at 0.5m Target depth reached			0.5				
	1								1
27									

RIG: Hand Tools **DRILLER:** VV **LOGGED:** VV **CASING:** Nill
TYPE OF BORING: Hand Auger
WATER OBSERVATIONS: No free ground water observed
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: United Care Ageing
PROJECT: Edinglassie Village Stage 2
LOCATION: 1 Emerald Street, Emu Plains

SURFACE LEVEL: 26.5
EASTING: 283043
NORTHING: 6262648
DIP/AZIMUTH: 90°/--

BORE No: 111
PROJECT No: 84503.02
DATE: 11/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	VWP Construction Details
		FILL/CLAYEY SILT: dark grey-black, trace rootlets, moist		E	0.0		PID<1		
	0.2	FILL/CLAY: dark grey-black, moist			0.2				
					0.4				
26				E			PID<1		
	0.6	FILL/CLAY: dark grey-black and brown			0.6				
					0.8				
	1			E*			PID<1		1
	1.2	Bore discontinued at 1.2m Hand auger refusal in fill			1.2				
25									

RIG: Hand Tools **DRILLER:** VV **LOGGED:** VV **CASING:** Nill
TYPE OF BORING: Hand Auger
WATER OBSERVATIONS: No free ground water observed
REMARKS: * Blind Duplicate BD05 taken from 0.8-1.2m

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: United Care Ageing
PROJECT: Edinglassie Village Stage 2
LOCATION: 1 Emerald Street, Emu Plains

SURFACE LEVEL: 26.4
EASTING: 283006
NORTHING: 6262621
DIP/AZIMUTH: 90°/--

BORE No: 112
PROJECT No: 84503.02
DATE: 11/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	VWP Construction Details
		FILL/Clayey SILT: grey-black, moist			0.0				
				E			PID<1		
	0.2	FILL/Clayey SILT: grey black, with roadbase gravel			0.2				
26					0.4				
				E			PID<1		
	0.6	Bore discontinued at 0.6m Hand auger refusal in fill			0.6				
	1								1
25									

RIG: Hand Tools **DRILLER:** VV **LOGGED:** VV **CASING:** Nill
TYPE OF BORING: Hand Auger
WATER OBSERVATIONS: No free ground water observed
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: United Care Ageing
PROJECT: Edinglassie Village Stage 2
LOCATION: 1 Emerald Street, Emu Plains

SURFACE LEVEL: 26.5
EASTING: 283010
NORTHING: 6262584
DIP/AZIMUTH: 90°/--

BORE No: 113
PROJECT No: 84503.02
DATE: 11/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	VWP Construction Details
		FILL/Clayey SILT: grey black, moist		E	0.0		PID<1		
	0.2	Bore discontinued at 0.2m Hand auger refusal in fill			0.2				
26									
	1								1
25									

RIG: Hand Tools **DRILLER:** VV **LOGGED:** VV **CASING:** Nill
TYPE OF BORING: Hand Auger
WATER OBSERVATIONS: No free ground water observed
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: United Care Ageing
PROJECT: Edinglassie Village Stage 2
LOCATION: 1 Emerald Street, Emu Plains

SURFACE LEVEL: 26.5
EASTING: 283104
NORTHING: 6262586
DIP/AZIMUTH: 90°/--

BORE No: 114
PROJECT No: 84503.02
DATE: 11/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	VWP Construction Details
		FILL/Clayey SILT: grey-black, trace roots		E	0.0		PID<1		
					0.2				
	0.3	CLAY: brown (possibly fill)							
26					0.4				
				E			PID<1		
					0.6				
	0.7	Bore discontinued at 0.7m Target depth reached							
	1								1
25									

RIG: Hand Tools **DRILLER:** VV **LOGGED:** VV **CASING:** Nill
TYPE OF BORING: Hand Auger
WATER OBSERVATIONS: No free ground water observed
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: United Care Ageing
PROJECT: Edinglassie Village Stage 2
LOCATION: 1 Emerald Street, Emu Plains

SURFACE LEVEL: 26.8
EASTING: 283119
NORTHING: 6262583
DIP/AZIMUTH: 90°/--

BORE No: 115
PROJECT No: 84503.02
DATE: 11/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	VWP Construction Details
		FILL/Clayey SILT: grey, trace roots			0.0				
				E			PID<1		
	0.2	FILL/CLAY: brown (possibly natural)			0.2				
					0.4				
				E*			PID<1		
	0.6	Bore discontinued at 0.6m Target depth reached			0.6				
26									
	1								1
25									

RIG: Hand Tools **DRILLER:** VV **LOGGED:** VV **CASING:** Nill
TYPE OF BORING: Hand Auger
WATER OBSERVATIONS: No free ground water observed
REMARKS: * Blind Duplicate BD02 taken from 0.4-0.6m

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: United Care Ageing
PROJECT: Edinglassie Village Stage 2
LOCATION: 1 Emerald Street, Emu Plains

SURFACE LEVEL: 26.8
EASTING: 283112
NORTHING: 6262612
DIP/AZIMUTH: 90°/--

BORE No: 116
PROJECT No: 84503.02
DATE: 11/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	VWP Construction Details
		FILL/Clayey SILT: pale grey-brown, trace fine sand		E*	0.0		PID<1		
					0.2				
	0.4	FILL/CLAY: brown (possibly natural)		E	0.4		PID<1		
					0.5				
	0.7	Bore discontinued at 0.7m Hand auger refusal							
26									
	1								1
25									

RIG: Hand Tools **DRILLER:** VV **LOGGED:** VV **CASING:** Nill
TYPE OF BORING: Hand Auger
WATER OBSERVATIONS: No free ground water observed
REMARKS: * Blind Duplicate BD01 taken from 0-0.2m

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: The Uniting Church in Australia Property Trust
PROJECT: Endinglassie Village Stage 2
LOCATION: 1-3 Emerald St & 6-8 Troy St, Emu Plains

SURFACE LEVEL: 28.1 AHD
EASTING: 282951
NORTHING: 6262617
DIP/AZIMUTH: 90°/--

BORE No: BH100
PROJECT No: 84503.01
DATE: 8/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
28	0.0			A/E	0.0				Gatic cover
		FILL/ SAND: fine to medium, pale brown, wet, generally in a medium dense condition			0.1				
	0.4	Clayey SAND SC: fine, orange-brown, trace silt, wet, loose to medium dense, alluvial		A/E*	0.5				Backfill 0.0-0.8m Solid PVC 0.1-1.0m
					0.6				
				A/E	0.9				
27	1				1.0				
				S			1,4,4 N = 8		
					1.45				
26	2								
	2.4	Silty SAND SM: fine to medium, pale orange-brown, trace clay, wet, medium dense to dense, alluvial			2.5				Gravel 0.8-4.0m Machine slotted PVC screen 1.0-4.0m
				S			14,14,18 N = 32		
25	3				2.95				
	4.0				4.0				End cap
24	4	SAND SP: fine to medium, pale orange, trace rounded gravel, wet, dense, alluvial		S			11,17,24 N = 41		
	4.45				4.45				
		Bore discontinued at 4.45m Practical refusal on gravel layer							
23	5								
22	6								
21	7								
20	8								
19	9								

16-03-22

RIG: Bobcat **DRILLER:** Jimmy **LOGGED:** NB **CASING:** Uncased

TYPE OF BORING: Solid Flight Auger (TC bit) to 4.3 m

WATER OBSERVATIONS: Free groundwater observed from surface due to surface water ponding.

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed to 4.0m (screen 1.0m-4.0m, Solid PVC 0.1m-1.0m, Gravel 0.8m-4.0m, Gatic cover at surface). *Field Replicate taken at 0.5-0.6m

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: The Uniting Church in Australia Property Trust
PROJECT: Endinglassie Village Stage 2
LOCATION: 1-3 Emerald St & 6-8 Troy St, Emu Plains

SURFACE LEVEL: 28.2 AHD
EASTING: 282971
NORTHING: 6262666
DIP/AZIMUTH: 90°/--

BORE No: BH101
PROJECT No: 84503.01
DATE: 11/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
28	0.1	FILL / Silty SAND: fine, dark grey, trace of organic debris, grass roots, moist		A/E	0.1–0.2				
				B	0.4				
	0.6	FILL/ Silty CLAY: medium plasticity, grey to grey-brown, trace of roadbase gravel, fine decomposed organic matter, w~PL, apparently firm		A/E	0.5–0.6				
27	1	CLAY CL: low plasticity, grey-brown, fine grained sand, w~PL, stiff, alluvial		A/E	0.9–1.0				1
				S	1.45		2,5,5 N = 10		
	1.8	SILTY CLAY CI: medium plasticity, grey-brown, w~PL, stiff, alluvial		A/E	1.9–2.0				
26	2				2.5				2
		At 2.6m: becoming sandy clay		S			5,8,21 N = 29		
	2.8	SAND SP: fine to medium, pale grey and brown, slightly cemented, dense, moist, alluvial		A/E	2.9–2.95–3.0				
25	3								3
				A/E	3.9–4.0				
24	4			S			16,21,20 N = 41		4
	4.5	Gravelly SAND SP-SW: fine to medium, brown, approximately 25% fine to medium river gravel, subrounded and rounded, very dense, moist, alluvial			4.5				
23	5								5
	5.5	Bore discontinued at 5.5m Practical refusal on gravel layer		S	5.4–5.5		20/100 refusal		
22	6								6
21	7								7
20	8								8
19	9								9

RIG: Geo 305 **DRILLER:** LL **LOGGED:** SI **CASING:** Uncased

TYPE OF BORING: Solid Flight Auger (TC bit) to 5.5 m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: The Uniting Church in Australia Property Trust
PROJECT: Endinglassie Village Stage 2
LOCATION: 1-3 Emerald St & 6-8 Troy St, Emu Plains

SURFACE LEVEL: 28.2 AHD
EASTING: 283056
NORTHING: 6262673
DIP/AZIMUTH: 90°/--

BORE No: BH102
PROJECT No: 84503.01
DATE: 11/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
28	0.2	FILL/ Gravelly SAND: medium to coarse, grey-brown, roadbase gravel, angular, loose, moist		A/E	0.1-0.2				Gatic cover Backfill 0.0-0.2m
		FILL/ Clayey SAND: fine to medium, grey-brown, trace of roadbase gravel, apparently medium dense, moist		A/E	0.4-0.5				Bentonite 0.2-0.8m Solid PVC 0.1-0.7m
	0.8	Clayey SAND SC: fine to medium, grey-brown, medium dense, moist, alluvial		A/E	0.9-1.0				
27	1			U	1.45		pp = 110		
	1.5	Silty CLAY CI: medium plasticity, pale grey-brown, w>PL, stiff, alluvial		A/E	1.9-2.0			▽	
26	2							▼ 16-03-22	Gravel 0.8-3.9m
	2.6	Gravelly SAND SP-SW: fine to medium , pale brown to orange-brown, fine to medium river gravel, medium dense then dense, moist, wet, alluvial		S	2.5-2.95		7,9,16 N = 25		Machine slotted PVC screen 1.4-3.9m
25	3								
24	4			S	4.0		15,25/150 refusal		End cap
	4.3	Bore discontinued at 4.3m Practical refusal on gravel layer			4.3				
23	5								
22	6								
21	7								
20	8								
19	9								

RIG: Geo 305 **DRILLER:** LL **LOGGED:** SI **CASING:** Uncased

TYPE OF BORING: Solid Flight Auger (TC bit) to 4.3 m

WATER OBSERVATIONS: Free groundwater at 2.0m whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. Standpipe installed to 3.9m (Screen 1.4m to 3.9m; Solid PVC to 0.1m; Gravel 0.8m to 3.9m; Bentonite 0.2m to 0.8m; Gatic Cover at surface.

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: The Uniting Church in Australia Property Trust
PROJECT: Endinglassie Village Stage 2
LOCATION: 1-3 Emerald St & 6-8 Troy St, Emu Plains

SURFACE LEVEL: 27.9 AHD
EASTING: 283143
NORTHING: 6262576
DIP/AZIMUTH: 90°/--

BORE No: BH103
PROJECT No: 84503.01
DATE: 1/3/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
27	0.2	FILL/ Silty CLAY: medium to high plasticity pale grey and orange, w<PL, generally in a soft condition		A/E	0.0 - 0.1				
		FILL/ Gravelly SAND: fine to medium, pale brown, fine igneous gravel, trace silt and terracotta fragments, moist, generally in a dense condition		A/E	0.4 - 0.5				
	0.8								
	0.9	TOPSOIL/ Silty CLAY: medium plasticity, dark brown, trace rootlets, w<PL, generally in a soft condition		A/E	0.9 - 1.0				
26	1	Silty CLAY CL-CI: low to medium plasticity, trace fine sand, red-brown, w<PL, stiff, alluvial		S			3,4,5 N = 9		
					1.45				
				U	1.5 - 1.8		U50 Sample (300mm)		
	2								
	2.4	SAND SP: fine, orange-red, trace silt, moist, medium dense, alluvial		S	2.5 - 2.95		4,3,5 N = 8		
25	3								
24	4				4.0				
	4.0	Clayey SAND SC: fine, orange-brown, trace silt, moist, medium dense, alluvial		S	4.45		3,5,5 N = 10		
23	5								
				S	5.5 - 5.95		5,6,8 N = 14		
22	6							▽	
	6.0	Clayey SAND SC: fine, brown, with silt, moist, medium dense, alluvial							
21	7								
	7.0	Below 6.9m rounded gravels <10mm							
		Bore discontinued at 7.0m Practical refusal on gravel layer							
20	8								
19	9								
18									

RIG: Bobcat **DRILLER:** Jimmy **LOGGED:** NB **CASING:** Uncased

TYPE OF BORING: Solid Flight Auger (TC bit) to 7 m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: The Uniting Church in Australia Property Trust
PROJECT: Endinglassie Village Stage 2
LOCATION: 1-3 Emerald St & 6-8 Troy St, Emu Plains

SURFACE LEVEL: 26.7 AHD
EASTING: 283093
NORTHING: 6262612
DIP/AZIMUTH: 90°/--

BORE No: BH104
PROJECT No: 84503.01
DATE: 1/3/2021
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
26	0.2	FILL/ Gravelly SAND: fine to coarse, pale brown and grey, medium to coarse sandstone gravel, moist, generally in a medium dense condition		A/E	0.0–0.1				
				A/E	0.4–0.5				
	0.6	FILL/ SAND: fine to medium, orange, moist, generally in a medium dense condition							
1		FILL/ SAND: fine to medium, pale brown, with fine igneous gravel fragments, trace silt and terracotta fragments, moist, generally in a dense condition		A/E*	0.9–1.0				
	1.3			S			13,9,3 N = 12		
25		Silty CLAY CL: low to medium plasticity, red-brown, w<PL, stiff, alluvial			1.45				
2				D	1.5–1.6				
				D	2.0–2.1				
24				S	2.5		2,4,5 N = 9		
3					2.95				
23	3.8	Clayey SAND SC: fine, orange-brown, trace silt, moist, medium dense, alluvial							
4				S	4.0		3,6,7 N = 13		
22					4.45				
5	5.0	Silty SAND SM: fine to medium brown, trace clay, moist, medium dense to dense, alluvial							
21				S	5.5		4,7,8 N = 15		
6					5.95				
				D	6.5–6.6				
20	6.6	Below 6.5m rounded gravels <20mm							
7		Bore discontinued at 6.6m Practical refusal on gravel layer							
19									
8									
18									
9									
17									

RIG: Bobcat **DRILLER:** Jimmy **LOGGED:** NB **CASING:** Uncased

TYPE OF BORING: Solid Flight Auger (TC bit) to 6.6 m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56. *Field replicate taken at 0.9-1.0m.

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: The Uniting Church in Australia Property Trust
PROJECT: Endinglassie Village Stage 2
LOCATION: 1-3 Emerald St & 6-8 Troy St, Emu Plains

SURFACE LEVEL: 26.5 AHD
EASTING: 283067
NORTHING: 6262590
DIP/AZIMUTH: 90°/--

BORE No: BH105
PROJECT No: 84503.01
DATE: 11/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Well Construction Details
26	0.0	FILL/ Gravelly SAND: fine to medium, pale grey, ripped sandstone gravel, loose, moist		A/E	0.4				
					0.5				
				A/E	0.9				
	1				1.0				1
				S			4,4,4 N = 8		
25	1.5				1.45				
		SAND SP: fine to medium, brown, loose to medium dense, moist, alluvial		A/E	1.9				
	2				2.0				2
24		At 2.5m: becoming wet		S	2.5		2,6,7 N = 13	▽	
	3				2.95				3
23	3.5	Clayey SAND SC: fine to medium, pale grey, trace of silt and clay, medium dense, wet, alluvial		A/E	3.9				
	4				4.0				4
				S			2,2,1 N = 3		
22	4.4	CLAY CH: high plasticity, brown and red-brown, w~PL, firm (wet) becoming stiff, alluvial			4.45				
	5								5
21	5.5	SAND SP: fine to medium, red-brown, medium dense, alluvial		S	5.5		5,9,7 N = 16		
	6				5.95				6
20									
	7			S	7.0		6,9,8 N = 17		7
19					7.45				
	8								8
	8.3								
18	8.55	Sandy GRAVEL GP-GW: fine to medium, rounded and subrounded, pale grey and brown, river gravel, fine to medium sand, dense to very dense, alluvial		S	8.5		25/50 refusal		
					8.55				
	9	Bore discontinued at 8.55m Practical refusal on gravel layer							9
17									

RIG: Geo 305 **DRILLER:** SS **LOGGED:** SI **CASING:** Uncased

TYPE OF BORING: Solid Flight Auger (TC bit) to 8.5 m

WATER OBSERVATIONS: Free groundwater at 2.5m whilst augering

REMARKS: Location coordinates are in MGA94 Zone 56.

SAMPLING & IN SITU TESTING LEGEND

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

Douglas Partners
Geotechnics / Environment / Groundwater

Sampling Methods

Douglas Partners

Sampling

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

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

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

Test Pits

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

Large Diameter Augers

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

Continuous Spiral Flight Augers

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

Non-core Rotary Drilling

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

Continuous Core Drilling

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

Standard Penetration Tests

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

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

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

  4,6,7
  N=13

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

  15, 30/40 mm

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

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

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

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

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are generally based on Australian Standard AS1726:2017, Geotechnical Site Investigations. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

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

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

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

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

Definitions of grading terms used are:

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

The proportions of secondary constituents of soils are described as follows:

In fine grained soils (>35% fines)

Term	Proportion of sand or gravel	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	>30%	Sandy Clay
With	15 – 30%	Clay with sand
Trace	0 - 15%	Clay with trace sand

In coarse grained soils (>65% coarse)
- with clays or silts

Term	Proportion of fines	Example
And	Specify	Sand (70%) and Clay (30%)
Adjective	>12%	Clayey Sand
With	5 - 12%	Sand with clay
Trace	0 - 5%	Sand with trace clay

In coarse grained soils (>65% coarse)
- with coarser fraction

Term	Proportion of coarser fraction	Example
And	Specify	Sand (60%) and Gravel (40%)
Adjective	>30%	Gravelly Sand
With	15 - 30%	Sand with gravel
Trace	0 - 15%	Sand with trace gravel

The presence of cobbles and boulders shall be specifically noted by beginning the description with ‘Mix of Soil and Cobbles/Boulders’ with the word order indicating the dominant first and the proportion of cobbles and boulders described together.

Soil Descriptions

Cohesive Soils

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

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	VS	<12
Soft	S	12 - 25
Firm	F	25 - 50
Stiff	St	50 - 100
Very stiff	VSt	100 - 200
Hard	H	>200
Friable	Fr	-

Cohesionless Soils

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

Relative Density	Abbreviation	Density Index (%)
Very loose	VL	<15
Loose	L	15-35
Medium dense	MD	35-65
Dense	D	65-85
Very dense	VD	>85

Soil Origin

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

- Residual soil - derived from in-situ weathering of the underlying rock;
- Extremely weathered material – formed from in-situ weathering of geological formations. Has soil strength but retains the structure or fabric of the parent rock;
- Alluvial soil – deposited by streams and rivers;
- Estuarine soil – deposited in coastal estuaries;
- Marine soil – deposited in a marine environment;
- Lacustrine soil – deposited in freshwater lakes;
- Aeolian soil – carried and deposited by wind;
- Colluvial soil – soil and rock debris transported down slopes by gravity;
- Topsoil – mantle of surface soil, often with high levels of organic material.
- Fill – any material which has been moved by man.

Moisture Condition – Coarse Grained Soils

For coarse grained soils the moisture condition should be described by appearance and feel using the following terms:

- Dry (D) Non-cohesive and free-running.
- Moist (M) Soil feels cool, darkened in colour.
  Soil tends to stick together.
  Sand forms weak ball but breaks easily.
- Wet (W) Soil feels cool, darkened in colour.
  Soil tends to stick together, free water forms when handling.

Moisture Condition – Fine Grained Soils

For fine grained soils the assessment of moisture content is relative to their plastic limit or liquid limit, as follows:

- ‘Moist, dry of plastic limit’ or ‘w <PL’ (i.e. hard and friable or powdery).
- ‘Moist, near plastic limit’ or ‘w ≈ PL (i.e. soil can be moulded at moisture content approximately equal to the plastic limit).
- ‘Moist, wet of plastic limit’ or ‘w >PL’ (i.e. soils usually weakened and free water forms on the hands when handling).
- ‘Wet’ or ‘w ≈LL’ (i.e. near the liquid limit).
- ‘Wet’ or ‘w >LL’ (i.e. wet of the liquid limit).

Rock Strength

Rock strength is defined by the Unconfined Compressive Strength and it refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects.

The Point Load Strength Index $Is_{(50)}$ is commonly used to provide an estimate of the rock strength and site specific correlations should be developed to allow UCS values to be determined. The point load strength test procedure is described by Australian Standard AS4133.4.1-2007. The terms used to describe rock strength are as follows:

Strength Term	Abbreviation	Unconfined Compressive Strength MPa	Point Load Index * $Is_{(50)}$ MPa
Very low	VL	0.6 - 2	0.03 - 0.1
Low	L	2 - 6	0.1 - 0.3
Medium	M	6 - 20	0.3 - 1.0
High	H	20 - 60	1 - 3
Very high	VH	60 - 200	3 - 10
Extremely high	EH	>200	>10

* Assumes a ratio of 20:1 for UCS to $Is_{(50)}$. It should be noted that the UCS to $Is_{(50)}$ ratio varies significantly for different rock types and specific ratios should be determined for each site.

Degree of Weathering

The degree of weathering of rock is classified as follows:

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

Rock Descriptions

Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with occasional fragments
Fractured	Core lengths of 30-100 mm with occasional shorter and longer sections
Slightly Fractured	Core lengths of 300 mm or longer with occasional sections of 100-300 mm
Unbroken	Core contains very few fractures

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq \text{100 mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or stronger. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

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

Symbols & Abbreviations

Introduction

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

Drilling or Excavation Methods

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

Water

▷	Water seep
▽	Water level

Sampling and Testing

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

Description of Defects in Rock

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

Defect Type

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

Orientation

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

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

Coating or Infilling Term

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

Coating Descriptor

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

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

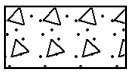
Symbols & Abbreviations

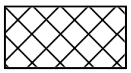
Graphic Symbols for Soil and Rock

General

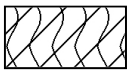

Asphalt

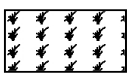

Road base

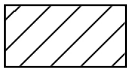

Concrete

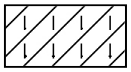

Filling

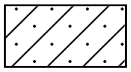
Soils


Topsoil

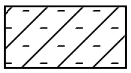

Peat

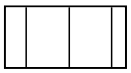

Clay

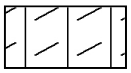

Silty clay

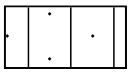

Sandy clay

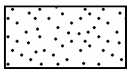

Gravelly clay

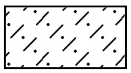

Shaly clay

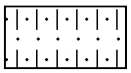

Silt


Clayey silt


Sandy silt

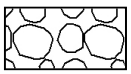

Sand

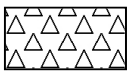

Clayey sand


Silty sand


Gravel

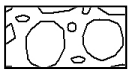

Sandy gravel


Cobbles, boulders

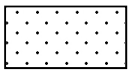

Talus

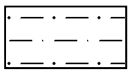
Sedimentary Rocks

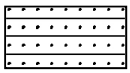

Boulder conglomerate

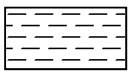

Conglomerate


Conglomeratic sandstone

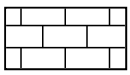

Sandstone


Siltstone

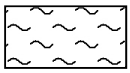

Laminite

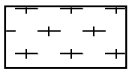

Mudstone, claystone, shale

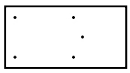

Coal


Limestone

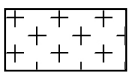
Metamorphic Rocks

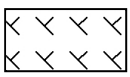

Slate, phyllite, schist

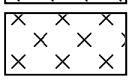

Gneiss

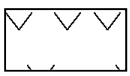

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

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Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	BH102
Project Name:	Emu Plains
Project Number:	84503.02
Site Location:	6 Troy St Emu Plains & 1 Emerald St Emu Plains
Bore GPS Co-ord:	
Installation Date:	11.3.2022
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details

Date/Time:	18-3-22 10 AM
Purged By:	VV
GW Level (pre-purge):	2.0 m bgl
Observed Well Depth:	4.0 m bgl
PSH observed:	Yes / (No) (interface / visual). Thickness if observed:
Estimated Bore Volume:	14.4 L
Total Volume Purged:	43.2 (target: no drill mud, min 3 well vol. or dry)
GW Level (post-purge):	3.80 m bgl
Equipment:	Twister Pump

Micropurge and Sampling Details

Date/Time:	23-3-2022 12 Pm
Sampled By:	VV
Weather Conditions:	cloudy
GW Level (pre-purge):	2.3 m bgl
Observed Well Depth:	4.0 m bgl
PSH observed:	Yes / (No) (interface / visual). Thickness if observed:
Estimated Bore Volume:	12.24 L
GW Level (post sample):	3.7 m bgl
Total Volume Purged:	L
Equipment:	Peri Pump.

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	**0.1° C**	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
0	21.0	4.17	1462	7.86	1318	101
1	23.4	2.30	1456	7.94	1185	98.6
2	23.6	2.22	1461	7.91	1169	99.0
3	23.7	2.21	1462	7.97	1164	99.3
4	23.7	2.57	1477	8.08	1125	99.9
5	23.8	2.67	1477	8.07	1109	100.4

Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			
	33.0	1503	977			

Sample Details

Sampling Depth (rationale):	3-3.5 m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	Orange, silty, earthy odours.
Sample ID:	BH102
QA/QC Samples:	RINSATE BetweenBH102 & AFTER BH106
Sampling Containers and filtration:	Metals filtered.
Comments / Observations:	

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Geotechnics / Environment / Groundwater

Groundwater Field Sheet

Project and Bore Installation Details

Bore / Standpipe ID:	**BH100**
Project Name:	Emu Plains
Project Number:	84503.02
Site Location:	1 Emerald St, Emu plains & 6 Troy St Emu plains
Bore GPS Co-ord:	
Installation Date:	
GW Level (during drilling):	m bgl
Well Depth:	m bgl
Screened Interval:	m bgl
Contaminants/Comments:	

Bore Development Details

Date/Time:	8AM - 16-03-2022
Purged By:	Venkat
GW Level (pre-purge):	1.3 m bgl
Observed Well Depth:	4.2 m bgl
PSH observed:	Yes / (No) (interface / visual). Thickness if observed:
Estimated Bore Volume:	20.88 L
Total Volume Purged:	62.64 (target: no drill mud, min 3 well vol. or dry)
GW Level (post-purge):	~~4.07~~ 4.07 m bgl
Equipment:	Twister Pump

Micropurge and Sampling Details

Date/Time:	23.3.2022
Sampled By:	Venkat Jallurapalli
Weather Conditions:	cloudy.
GW Level (pre-purge):	2 m m bgl
Observed Well Depth:	4.30 m bgl
PSH observed:	Yes / (No) (interface / visual). Thickness if observed:
Estimated Bore Volume:	16.56 L
GW Level (post sample):	4.00 m bgl
Total Volume Purged:	L
Equipment:	Peri Pump.

Water Quality Parameters

Time / Volume	Temp (°C)	DO (mg/L)	EC (µS or mS/cm)	pH	Turbidity	Redox (mV)
Stabilisation Criteria (3 readings)	***0.1° C***	**+/- 0.3 mg/L**	**+/- 3%**	**+/- 0.1**	**+/- 10%**	**+/- 10 mV**
0	23.5	5.56	333.7	7.20	4277	120
1	23.4	5.31	333.0	7.13	4360	121.8
2	23.5	5.35	332	7.10	4350	122.7
3	23.5	5.35	332	7.11	4287	122.9
4						

Additional Readings Following stabilisation:	DO % Sat	SPC	TDS			
	62.60	342.1	222			

Sample Details

Sampling Depth (rationale):	3.0-4.0 m bgl,
Sample Appearance (e.g. colour, siltiness, odour):	Pale orange, silty, earthy odour.
Sample ID:	BH106
QA/QC Samples:	BD01 20220323
Sampling Containers and filtration:	Metals filtered.
Comments / Observations:	

BH101

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 09-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 3.1
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
CC				Fill	Fill - Concrete		No odours, stains, or ACM noted
SFA		0.15		Fill	Fill - Gravelly Silt - yellow, light brown, heterogeneous, dry, non-plastic, with some fine angular gravels	BH101 0.15-0.25 PID = 0.1 ppm	No odours, stains, or ACM noted
	0.5					BH101 0.4-0.5 PID = 0.1 ppm	
	1.0					BH101 0.9-1.0 PID = 0.1 ppm	
	1.5					BH101 1.4-1.5 PID = 0.1 ppm	
	2.0					BH101 2.0-2.1 PID = 0.1 ppm	
		2.10		CL-ML	Silty Clay - brown, orange, red, mottled, heterogeneous, dry, low plasticity, very soft, no inclusions		No odours, stains, or ACM noted
	2.5					BH101 2.5-2.6 PID = 0.1 ppm	
		2.90		CL-ML	Silty Clay - red, homogeneous, dry, low plastcity, soft		No odours, stains, or ACM noted
	3.0					BH101 3.0-3.1 PID = 0.1 ppm	
		3.10			Borehole BH101 terminated at 3.1m		End of hole at program depth
	3.5						

BH102

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 09-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 3.2
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
CC				Fill	Fill - Concrete, with tin and red fabric underneath		No odours, stains, or ACM noted
SFA		0.15		Fill	Fill - Gravelly Silt - yellow, light grey/ brown, heterogeneous, dry, loose, soft, with inclusions of very fine angular gravels	BH102 0.2-0.3 PID = 0.1 ppm	No odours, stains, or ACM noted
	0.5					BH102 0.5-0.6 PID = 0.1 ppm	
	1.0					BH102 1.0-1.1 PID = 0.1 ppm	
	1.5						
	2.0					BH102 2.0-2.1 PID = 0.1 ppm	
		2.10		Fill	Fill - Gravelly Silt - grey, brown, heterogeneous, dry, soft, with inclusions of trace gravels and some clay clasts (Increasing with depth)		No odours, stains, or ACM noted
	2.5					BH102 2.3-2.4 PID = 0.1 ppm	
		2.80		CL-ML	Silty Clay - red, brown, mottled, heterogeneous, dry, soft, no inclusions		No odours, stains, or ACM noted
	3.0						End of hole at program depth
						BH102 3.0-3.1 PID = 0.1 ppm	
		3.20			Borehole BH102 terminated at 3.2m		
	3.5						

BH103

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 09-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 3
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
CC				Fill	Fill - Concrete		No odours, stains, or ACM noted
SFA		0.15		Fill	Fill - Gravelly Silt - yellow, medium brown, heterogeneous, dry, soft, non-plastic	BH103 0.2-0.3 PID = 0.1 ppm	No odours, stains, or ACM noted
	0.5					BH103 0.5-0.6 PID = 0.1 ppm	
	1.0					BH103 1.0-1.1 PID = 0.1 ppm	Trace terracotta fragments observed
	1.5						
		1.80		CL-GC	Gravelly clay - dark grey, heterogeneous, damp, soft, low-medium plasticity, with fine angular gravels		No odours, stains, or ACM noted
	2.0					BH103 1.9-2.0 PID = 0.1 ppm	
	2.5						
		2.80		CL	Clay - red, grey, brown, mottled, heterogeneous, damp, medium-high plasticity, soft, with inclusions of some trace shale gravels		No odours, stains, or ACM noted
	3.0					BH103 2.9-3.0 PID = 0.1 ppm	
		3.00			Borehole BH103 terminated at 3m		End of hole at program depth
	3.5						

BH104

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 09-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 2.5
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
SFA				Fill	Fill - Brick pavers (courtyard area)		No odours, stains, or ACM noted
		0.10		Fill	Fill - Gravelly Silt - yellow, medium brown, heterogeneous, dry, soft, non-plastic	BH104 0.1-0.2 PID = 0.1 ppm	
	0.5					BH104 0.5-0.6 PID = 0.1 ppm	
	1.0					BH104 1.0-1.0 PID = 0.1 ppm	No odours, stains, or ACM noted
	1.5						
		1.70		CL	Clay - dark grey, red, motled, damp, medium plasticity, soft		
	2.0					BH104 2.0-2.1 PID = 0.1 ppm	No odours, stains, or ACM noted
	2.5						
		2.50			Borehole BH104 terminated at 2.5m		End of hole at program depth
	3.0						
	3.5						

BH105

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 10-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
PT				Fill	Fill - Silty Clay (topsoil) - medium brown, heterogeneous, dry, soft, non-plastic, with inclusions of bark chips, rootlets and trace roadbase gravels	BH105 0.0-0.1 PID = 0.1 ppm	No odours, stains, or ACM noted
		0.30		Fill	Fill - Gravelly Silt - yellow, light grey/ brown, heterogeneous, dry, loose, soft, with inclusions of very fine angular gravels	BH105 0.3-0.4 PID = 0.1 ppm	No odours, stains, or ACM noted
	0.5						
		0.50		CL	Clay - red, grey mottled, soft, dry to damp, low-medium plasticity		No odours, stains, or ACM noted
	1.0					BH105 0.9-1.0 PID = 0.1 ppm	
		1.20			Borehole BH105 terminated at 1.2m		End of hole at program depth
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BH106

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 09-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 1.7
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
CC				Fill	Fill - Concrete		No odours, stains, or ACM noted
SFA		0.20		Fill	Fill - Gravelly Silt - yellow, light grey/ brown, heterogeneous, dry, loose, soft, with inclusions of very fine angular gravels	BH106 0.2-0.3 PID = 0.1 ppm	No odours, stains, or ACM noted
	0.5					BH106 0.5-0.6 PID = 0.1 ppm	
		0.80		CL-ML	Silty Clay - red, brown, heterogeneous, dry, soft, low plasticity, no inclusions		No odours, stains, or ACM noted
	1.0					BH106 1.0-1.1 PID = 0.1 ppm	
	1.5					BH106 1.5-1.6 PID = 0.1 ppm	
		1.70			Borehole BH106 terminated at 1.7m		End of hole at program depth
	2.0						
	2.5						
	3.0						
	3.5						

BH107

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 10-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 1.2
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
PSFA				Fill	Fill - Asphalt and roadbase gravels (driveway)		No odours, stains, or ACM noted
		0.05		Fill	Fill - Gravelly Silt - yellow, light grey/ brown, heterogeneous, dry, loose, soft, with inclusions of very fine angular gravels	BH107 0.1-0.1 PID = 0.1 ppm	No odours, stains, or ACM noted
		0.35		CL	Clay - red, brown, grey, mottled, heterogeneous, dry, soft to firm, low-medium plasticity		
	0.5					BH107 0.4-0.5 PID = 0.1 ppm	No odours, stains, or ACM noted
	1.0					BH107 0.9-1.0 PID = 0.1 ppm	
		1.20			Borehole BH107 terminated at 1.2m		End of hole at program depth
	1.5						
	2.0						
	2.5						
	3.0						
	3.5						

BH108

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 11-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 2.2
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
PT	0.5			Fill	Fill - Gravelly Silt -light grey/ brown, heterogeneous, dry, loose, soft, with inclusions of very fine angular gravels and rootlets	BH108 0.0-0.1 PID = 0.1 ppm	No odours, stains, or ACM noted
		0.50		Fill	Fill - Sandy Gravelly SILT - yellow, light brown, heterogeneous, soft, non-plastic, increasing sand content with depth	BH108 0.5-0.6 PID = 0.1 ppm	No odours, stains, or ACM noted
	1.0	0.90		SW	Sand - orange, brown, mottled, homogeneous, damp, loose to medium dense	BH108 0.9-1.0 PID = 0.1 ppm	No odours, stains, or ACM noted
	1.5	1.40		CL	Clay - red, grey, brown, mottled, damp, medium to high plasticity, soft		No odours, stains, or ACM noted
	2.0					BH108 2.0-2.1 PID = 0.1 ppm	
	2.5	2.20			Borehole BH108 terminated at 2.2m		End of hole at program depth
	3.0						
	3.5						

BH109

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 11-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 2.2
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
PT				Fill	Fill - Sandy Gravelly Silt - yellow, light grey/ brown, heterogeneous, dry, loose, soft, with inclusions of very fine angular gravels	BH109 0.0-0.1 PID = 0.1 ppm	No odours, stains, or ACM noted
		0.40		Fill	Fill - Sandy Gravelly Silt, light grey/ brown, heterogeneous, dry, loose, with inclusions of angular shale gravels		No odours, stains, or ACM noted
	0.5	0.45		SW	Sand - yellow, grey, homogeneous, fine-medium grained, loose-medium dense, no inclusions	BH109 0.5-0.6 PID = 0.1 ppm	No odours, stains, or ACM noted
	1.0					BH109 0.9-1.0 PID = 0.1 ppm	
	1.5						
	2.0					BH109 2.0-2.1 PID = 0.1 ppm	
		2.20			Borehole BH109 terminated at 2.2m		End of hole at program depth
	2.5						
	3.0						
	3.5						

BH110

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 10-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 2.2
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
PT				Fill	Fill - Gravelly Silty Clay (topsoil) - medium brown, heterogeneous, dry, non-plastic, soft, with inclusions of leaf litter	BH110 0.0-0.1 PID = 0.1 ppm	No odours, stains, or ACM noted
		0.10		Fill	Fill - Gravelly Silt - yellow, light grey/ brown, heterogeneous, dry, loose, soft		No odours, stains, or ACM noted
						BH110 0.3-0.4 PID = 0.1 ppm	
	0.5						
		0.80		SW	Sand - yellow, fine grained, homogeneous,dry, loose to medium dense		No odours, stains, or ACM noted
	1.0					BH110 1.0-1.1 PID = 0.1 ppm	
	1.5						
		1.50		SC	Clayey Sand - orange, grey, mottled, homogeneous, dry, loose to medium dense		No odours, stains, or ACM noted
	2.0					BH110 2.0-2.1 PID = 0.1 ppm	
		2.20			Borehole BH110 terminated at 2.2m		End of hole at program depth
	2.5						
	3.0						
	3.5						

BH111

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 10-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 2.2
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
PT	0.5			Fill	Fill - Gravelly Silt -medium brown, heterogeneous, soft, dry, non-plastic, with inclusions of fine-medium angular gravels, bark and roots	BH111 0.0-0.1 PID = 0.1 ppm	No odours, stains, or ACM noted
						BH111 0.3-0.4 PID = 0.1 ppm	Trace Ash observed
	1.0					BH111 0.9-1.0 PID = 0.1 ppm	
		1.30		CL-SC	Sandy Clay - grey, orange, mottled, dry, low-medium plasticity, soft		No odours, stains, or ACM noted
	1.5						
	2.0					BH111 2.0-2.1 PID = 0.1 ppm	
		2.20			Borehole BH111 terminated at 2.2m		End of hole at program depth
	2.5						
	3.0						
	3.5						

BH112

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 11-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 2.2
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
PT	0.5			Fill	Fill - Silty Gravelly CLAY - yellow, light grey/ brown, heterogeneous, dry to damp, loose, soft, , with inclusions of rootlets and angular shale gravels (increasing sand content with depth)	BH112 0.0-0.1 PID = 0.1 ppm BH112 0.5-0.6 PID = 0.1 ppm	No odours, stains, or ACM noted
	1.0	0.80		SW	Sand - yellow, light brown, homogeneous, fine grained, loose-medium dense	BH112 0.9-1.0 PID = 0.1 ppm	No odours, stains, or ACM noted
	1.5	1.40		SC	Clayey SAND - yellow, grey, red, mottled, heterogeneous, dry to damp, loose, increasing clay content with depth		No odours, stains, or ACM noted
	2.0					BH112 2.0-2.1 PID = 0.1 ppm	
	2.5	2.20			Borehole BH112 terminated at 2.2m		End of hole at program depth
	3.0						
	3.5						

BH113

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 11-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 2.2
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
PT	0.5			Fill	Fill - Gravelly Sandy CLAY - brown, orange, heterogeneous, damp, soft, low to medium plasticity, with inclusions of subangular shale gravels (increasing with depth)	BH113 0.0-0.1 PID = 0.1 ppm	No odours, stains, or ACM noted
						BH113 0.4-0.5 PID = 0.1 ppm	
		0.50		SHALE	Fill - Shale gravels - angular to sub angular, heterogeneous, dry		No odours, stains, or ACM noted
		0.55		SW	Sand - yellow, light brown, homogeneous, loose-medium dense, fine-medium grained, no inclusions		No odours, stains, or ACM noted
	1.0					BH113 1.0-1.1 PID = 0.1 ppm	
	1.5						
		1.50		SC	Clayey SAND - yellow, grey, orange, mottled, dry to damp, loose-medium dense, fine-medium grained, increasing clay content with depth		No odours, stains, or ACM noted
	2.0					BH113 2.0-2.1 PID = 0.1 ppm	
		2.20			Borehole BH113 terminated at 2.2m		End of hole at program depth
	2.5						
	3.0						
	3.5						

BH114

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 10-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 3.2
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
PT				Fill	Fill - Silty Gravelly Clay (topsoil) - brown, light brown, yellow, heterogeneous, dry, soft, non-plastic, inclusions of trace rootlets	BH114 0.0-0.1 PID = 0.1 ppm	No odours, stains, or ACM noted
	0.5	0.40		SM	Silty SAND - light grey, brow, homogeneous, dry to damp, (increasing moisture with depth) loose, no inclusions	BH114 0.5-0.6 PID = 0.1 ppm	No odours, stains, or ACM noted
	1.0					BH114 0.9-1.0 PID = 0.1 ppm	
	1.5						
	2.0					BH114 1.9-2.0 PID = 0.1 ppm	
		2.20		CL-ML	Silty CLAY - red, grey, mottled,damp to wet, medium to high plasticity, soft		No odours, stains, or ACM noted
	2.5						
	3.0					BH114 3.0-3.1 PID = 0.1 ppm	
		3.20			Borehole BH114 terminated at 3.2m		End of hole at program depth
	3.5						

BH115

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 10-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 3.2
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
PT	0.5			Fill	Fill - Silty Gravelly Clay - medium brown, heterogeneous, dry, non-plastic, soft, with inclusions of roadbase gravels and rootlets	BH115 0.0-0.1 PID = 0.1 ppm	No odours, stains, or ACM noted
						BH115 0.5-0.6 PID = 0.1 ppm	Trace ceramic fragments observed
	1.0	0.90		Fill	Fill - Sandy Clay, red, brown, heterogeneous, dry, soft, non-low plasticity, with inclusions of trace fine angular gravels		No odours, stains, or ACM noted
	1.5					BH115 1.0-1.1 PID = 0.1 ppm	
		1.60		SW	Sand - grey, yellow, very fine grained, homogeneous, dry, loose,		No odours, stains, or ACM noted
	2.0					BH115 2.0-2.1 PID = 0.1 ppm	
	2.5						
		2.50		CL-SC	Sandy Clay - orange, grey, mottled, dry to damp, soft, non-low plasticity		No odours, stains, or ACM noted
	3.0					BH115 3.0-3.1 PID = 0.1 ppm	
		3.20			Borehole BH115 terminated at 3.2m		End of hole at program depth
	3.5						

BH116

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 10-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 3.2
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
PT				Fill	Fill - Silty Gravelly Clay (topsoil) - medium brown, heterogeneous, dry, soft, low plasticity	BH116 0.0-0.1 PID = 0.1 ppm	No odours, stains, or ACM noted
		0.20		Fill	Fill - Gravelly Silt - yellow, light grey/brown, heterogeneous, dry, loose, soft, with inclusions of very fine angular gravels		No odours, stains, or ACM noted
	0.5					BH116 0.3-0.4 PID = 0.1 ppm	
		0.90		SW	Sand - light brown, yellow, homogeneous, dry, loose, fine-medium grained	BH116 0.9-1.0 PID = 0.1 ppm	No odours, stains, or ACM noted
	1.0						
	1.5	1.50		CL-SC	Sandy Clay -light brown, yellow, orange, mottled, dry, low to medium plasticity, soft		No odours, stains, or ACM noted
	2.0					BH116 2.0-2.1 PID = 0.1 ppm	
	2.5	2.50		CL	Clay - orange, grey, mottled, damp, high plasticity, soft		No odours, stains, or ACM noted
	3.0					BH116 3.0-3.1 PID = 0.1 ppm	
		3.20			Borehole BH116 terminated at 3.2m		End of hole at program depth
	3.5						

BH117

Project Number: 55566
Client: Uniting Care
Project Name: DSI Emu Plains
Site Address: 1-11 Emerald Street, Emu Plains, NSW

Date: 10-Jan-19
Logged By: C Bennett
Contractor: Terratest
Total Hole Depth (mbgs): 2
Bore Diameter (mm):

Eastings (GDA 94):
Northings (GDA 94):
Zone/Area/Permit#:
Reference Level: Ground Surface
Elevation (m):

Method	Depth (mbgs)	Contact (mbgs)	Graphic Log	Lithological Class	Lithological Description	Samples Tests Remarks	Additional Observations
PT				Fill	Fill - Silty Gravelly Clay (topsoil) - medium brown, heterogeneous, dry, soft, non plastic	BH117 0.0-0.1 PID = 0.1 ppm	No odours, stains, or ACM noted
						BH117 0.2-0.3 PID = 0.1 ppm	
		0.30		Fill	Fill - Silty Gravelly Clay -brown, red, heterogeneous, dry, soft, non - low plasticity, with inclusions of trace brick fragments, shale and lithologic roadbase gravels		No odours, stains, or ACM noted
	0.5						
						BH117 0.8-0.9 PID = 0.1 ppm	
	1.0						
	1.5	1.50		SW	Sand - yellow, light brown, heterogeneous, dry, fine grained, loose-medium dense.		No odours, stains, or ACM noted
	2.0					BH117 1.9-2.0 PID = 0.1 ppm	
		2.00			Borehole BH117 terminated at 2m		End of hole at program depth
	2.5						
	3.0						
	3.5						

Appendix E

Site Assessment Criteria

Appendix E
Site Assessment Criteria
1-3 Emerald Street and 6-8 Troy Street, Emu Plains

E1.0 Introduction

E1.1 Guidelines

The following key guidelines were consulted for deriving the Site Assessment Criteria (SAC):

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).
- CRC CARE *Health screening levels for petroleum hydrocarbons in soil and groundwater* (CRC CARE, 2011).
- HEPA *PFAS National Environmental Management Plan (NEMP)* (HEPA, 2020).
- ANZG *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018).
- NHMRC *Guidelines for Managing Risks In Recreational Water* (NHMRC, 2008).
- NHMRC, NRMMC *Australian Drinking Water Guidelines 6 2011, Version 3.2* (NHMRC, NRMMC, 2016).
- ANZECC *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC, 2000).

E1.2 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 were 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: residential (adopted for proposed retirement village land use).
  - Corresponding to land use category 'A', residential with garden / accessible soil (home grown produce <10% fruit and vegetable intake, (no poultry)), also includes children's day care centres, preschools and primary schools.
- Soil type: sand (soil type encountered a combination of fill, sand, silty sand and clay therefore sand adopted as a conservative measure).

E2.0 Soils

E2.1 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 in Table 1 and Table 2.

Table 1: Health Investigation Levels (mg/kg)

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

Contaminant	HIL-A
OPP	
Chlorpyrifos	160
PCB	
PCB	1

Table 2: Health Screening Levels (mg/kg)

Contaminant	HSL-A&B	HSL-A&B
SAND	**0 m to <1 m**	**1 m to <2 m**
Benzene	0.5	0.5
Toluene	160	220
Ethylbenzene	55	NL
Xylenes	40	60
Naphthalene	3	NL
TRH F1	45	70
TRH F2	110	240

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

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

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

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

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

Contaminant	DC HSL-A	DC HSL-IMW
Benzene	100	1100
Toluene	14 000	120 000
Ethylbenzene	4500	85 000
Xylenes	12 000	130 000
Naphthalene	1400	29 000
TRH F1	4400	82 000
TRH F2	3300	62 000
TRH F3	4500	85 000
TRH F4	6300	120 000

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

E2.2 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 in Table 4.

Table 4: Health Investigation Levels (mg/kg)

Contaminant	HIL-A
PFOS and PFHxS *	0.01
PFOA	0.1

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

E2.3 Asbestos in Soil

Based on the CSM and/or current site access limitations, a detailed asbestos assessment was not considered to be warranted at this stage. However, due to the history of widespread use of ACM products across Australia, ACM can be encountered unexpectedly and sporadically at any site. Therefore, the presence or absence of asbestos at a limit of reporting of 0.1 g/kg (AS:4964) has been adopted for this investigation / assessment as an initial screen.

The previous JBS&G (2019) investigation include 500 ml FA and AF analysis. The HSL for asbestos in soil adopted for these samples 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
ACM	0.01%
FA and AF	0.001%
FA and AF and ACM	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.

E2.4 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 shown in Table 7 with inputs into their derivation shown in Table 6.

Table 6: Inputs to the Derivation of the Ecological Investigation Levels

Variable	Input	Rationale
Age of contaminants	“Aged” (>2 years) / “new” (<2 years)	Contaminant sources > 2 years
pH	8.15	Site measured
CEC	14.90 $cmol_c/kg$	Site measured
Clay content	5 %	Assumed
Traffic volumes	high	
State / Territory	NSW	

Table 7: Ecological Investigation Levels (mg/kg)

Contaminant	EIL-A-B-C
Metals	
Arsenic	100
Copper	230
Nickel	220
Chromium III	330
Lead	1100
Zinc	670
PAH	
Naphthalene	170
OCP	
DDT	180

Notes: EIL-A-B-C urban residential and public open space

E2.5 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 shown in Table 8.

Table 8: Ecological Screening Levels (mg/kg)

Contaminant	Soil Type	EIL-A-B-C
Benzene	Coarse	50
Toluene	Coarse	85
Ethylbenzene	Coarse	70
Xylenes	Coarse	105
TRH F1	Coarse/ Fine	180*
TRH F2	Coarse/ Fine	120*
TRH F3	Coarse	300
TRH F4	Coarse	2800
B(a)P	Coarse	0.7

Notes: ESL are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability
TRH F1 is TRH C_6-C_{10} minus BTEX
TRH F2 is TRH >C_{10}-C_{16} including naphthalene
EIL-A-B-C urban residential and public open space

E2.6 Ecological Soil Guideline Values

The interim ecological soil guideline values (EGV) derived from Table3 of HEPA (2020) are 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

E2.7 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 in Table 10.

Table 10: Management Limits (mg/kg)

Contaminant	Soil Type	ML-A-B-C
TRH F1	Coarse	700
TRH F2	Coarse	1000
TRH F3	Coarse	2500
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

E3.0 Groundwater

E3.1 Introduction

The groundwater investigation levels (GIL) used for interpretation of the groundwater data (as a Tier 1 assessment) have been selected based on the potential risks posed from contamination sourced from the site to receptors at or down-gradient of the site, as identified by the conceptual site model (CSM). The receptors, exposure points and pathways are summarised in Table 11.

Table 11: Summary of Potential Receptors and Potential Risks

Receptor	Location	Exposure Point	Exposure Pathway
Surface water aquatic ecosystem	Down-gradient from site.	Receiving surface water body at the groundwater discharge point.	Exposure to contaminants.
Occupants of buildings	On site and down-gradient from site.	Enclosed buildings (existing or proposed).	Inhalation of VOC (including TRH and BTEX) overlying VOC impacted groundwater via the vapour intrusion pathway.
Drinking Water	On site and down-gradient from site.	Potential for drinking water bores down gradient of site (although none identified)	Direct contact / consumption

The rationale for the selection of GIL is in Table 12.

Table 12: Groundwater Investigation Level Rationale

Receptor / Beneficial Use	GIL	Source	Comments / Rationale
Aquatic ecosystem	DGV	ANZG (2018)	Freshwater 99% LOP for bioaccumulative contaminants 95% LOP for non-bioaccumulative contaminants
Aquatic ecosystem	DGV	HEPA (2020)	Freshwater 99% LOP Screening values were only available for PFOS and PFOA at the time of this investigation.
Building occupants (vapour intrusion)	HSL	NEPC (2013)	2 m to <4 m
Drinking water	GV	NHMRC (2016)	Health and aesthetic-based GV

Notes: DGV default guideline value
% LOP percentage level of protection of species
HSL health screening level
GV guideline value
LTV long term value (up to 100 years)
STV short term value (up to 20 years)

E3.2 Groundwater Investigation Levels for Aquatic Ecosystems

The DGV for the protection of aquatic ecosystems derived from ANZG (2018) are in Table 13.

Table 13: Groundwater Investigation Levels for Protection of Aquatic Ecosystems (µg/L)

Chem Name	Units	ANZG (2018) Freshwater (unknown reliability) toxicant DGVs	ANZG (2018) Freshwater 95% toxicant DGVs	Drinking Water
Arsenic (Filtered)	mg/L		0.024	0.01
Cadmium (Filtered)	mg/L		0.0002	0.002
Chromium (III+VI) (Filtered)	mg/L		0.0033	
Copper (Filtered)	mg/L		0.0014	2
Lead (Filtered)	mg/L		0.0034	0.01
Mercury (Filtered)	mg/L		0.0006	0.001
Nickel (Filtered)	mg/L		0.011	0.02
Zinc (Filtered)	mg/L		0.008	
Sulphate	mg/L			500
Aldrin	mg/L	0.000001		
DDT	mg/L		0.00001	0.009
Dieldrin	mg/L	0.00001		
Endrin	mg/L		0.00002	
g-BHC (Lindane)	mg/L		0.0002	0.01
Heptachlor	mg/L		0.00009	
Heptachlor epoxide	mg/L			0.0003
Hexachlorobenzene	mg/L		0.0001	
Methoxychlor	mg/L	0.000004		
Azinophos methyl	mg/L		0.00002	0.03
Chlorpyrifos	mg/L		0.00001	0.01
Diazinon	mg/L		0.00001	0.004
Dichlorvos	mg/L			0.005
Dimethoate	mg/L		0.00015	0.007
Ethion	mg/L			0.004
Fenitrothion	mg/L		0.0002	0.007
Malathion	mg/L		0.00005	0.07
Methyl parathion	mg/L			0.0007
Parathion	mg/L		0.000004	0.02
Anthracene	mg/L		0.0004	
Benzo(a) pyrene	mg/L		0.0002	0.00001
Fluorene	mg/L		0.0014	
Phenanthrene	mg/L		0.016	
Pyrene	mg/L		0.002	
Arochlor 1242	mg/L		0.0006	

Chem Name	Units	ANZG (2018) Freshwater (unknown reliability) toxicant DGVs	ANZG (2018) Freshwater 95% toxicant DGVs	Drinking Water
Arochlor 1254	mg/L		0.00003	
Xylene (o)	mg/L		0.35	
Benzene	mg/L		0.95	0.001
Ethylbenzene	mg/L		0.08	0.3
Naphthalene	mg/L		0.016	
Toluene	mg/L		0.18	0.8
Xylene (o)	mg/L		0.35	

Notes: Where the contaminant does not have a % LOP, the 'unknown' LOP has been adopted

The DGV for the protection of aquatic ecosystems derived from HEPA (2020) are in Table 14.

Table 14: Groundwater Investigation Levels for Protection of Aquatic Ecosystems (µg/L)

Contaminant / LOP	Fresh Water DGV	Interim Marine Water DGV
PFOS 99% LOP	0.00023	0.00023
PFOA 99% LOP	19	19
PFOS 95% LOP	0.13	220
PFOA 95% LOP	0.13	220

E3.3 Health Screening Levels for Vapour Intrusion

The HSL to evaluate potential vapour intrusion risks derived from NEPC (2013) are in Table 15.

Table 15: Groundwater Health Screening Levels for Vapour Intrusion (µg/L)

Contaminant	HSL-A&B	Solubility Limit
SAND	**2 m to <4 m**	**-**
Benzene	800	59 000
Toluene	NL	61 000
Ethylbenzene	NL	3900
Xylenes	NL	21 000
Naphthalene	NL	170
TRH F1	1000	9000
TRH F2	1000	3000

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

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

The solubility limit is defined as the groundwater concentration at which the water cannot dissolve any more of an individual chemical based on a petroleum mixture. The soil vapour that is in equilibrium with the groundwater will be at its maximum. If the derived groundwater HSL exceeds the water solubility limit, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result 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'.

E4.0 References

ANZECC. (2000). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Australia and New Zealand Environment and Conservation Council.

ANZG. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Canberra, ACT: Australian and New Zealand Governments and Australian state and territory governments.

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NHMRC. (2008). *Guidelines for Managing Risks In Recreational Water.*

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Appendix F

Fieldwork Methods

Appendix F
Fieldwork Methods
1-3 Emerald Street and 6-8 Troy Street, Emu Plains

1.0 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).

2.0 Drilling Methods

The drilling methods comprised:

- The drilling of six boreholes (BH100 to BH105) using a truck mounted drill rig fitted with solid flight augers and a tungsten carbide (TC) bit. The bores were drilled to depths of between 4.3 m and 8.55 m to identify the subsurface conditions.
- Standard penetration tests (SPT) carried out at regular depth intervals during auger drilling of the boreholes to assess in situ strength and subsoil consistency.
- Installation of a standpipe in boreholes BH100 and BH102 to monitor groundwater levels and test groundwater.

In addition to the above, a further ten shallow boreholes (BH107 to BH116) were drilled using hand tools to between 0.2 m and 1.5 m below ground level.

3.0 Soil Sampling

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

- Collection of soil samples directly from the solid flight auger / hand tools at the nominated sample depths;
- Transfer samples in laboratory-prepared glass jars with Teflon lined lids by hand, capping immediately and minimising headspace within the sample jar;
- Transfer samples in laboratory-prepared container (specific for PFAS) by hand, capping immediately and minimising headspace within the sample jar;
- Collect replicate samples in zip-lock bags for PID screening;
- Collect ~40 g to 50 g samples in zip-lock bags for asbestos (presence / absence) analysis;

- Wear a new disposable nitrile glove for each sample point thereby minimising potential for cross-contamination;
- Collect 10% replicate samples for QC purposes;
- Label sample containers with individual and unique identification details, including project number, sample location and sample depth (where applicable);
- Place samples into a cooled, insulated and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

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

3.1 Field Testing

Field testing is carried out in accordance with DP 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.

4.0 Groundwater Sampling

4.1 Monitoring Well Installation

Monitoring wells were constructed using class 18 uPVC machine slotted screen and blank sections with screw threaded joints. The screened section of each well is backfilled with a washed sand filter pack to approximately 0.5 m above the screened interval. Each well is completed with a hydrated bentonite plug of at least 0.5 m thick, finished with cast iron road-box.

4.2 Monitoring Well Development

Groundwater monitoring wells were developed as soon as practicable following well installation. The purpose of well development is to remove sediments and/or drilling fluid introduced to the well during drilling and to facilitate connection of the monitoring well to the aquifer. The wells are developed by pumping / bailing to remove a minimum of five well volumes, or until dry.

4.3 Groundwater Sampling

Groundwater sampling was carried out in accordance with DP standard operating procedures. Groundwater samples are collected using a positive displacement low flow bladder pump via the micro-purge (minimal drawdown) method. The method minimises aeration of the sample and disturbance to the water column thereby enhancing the quality of results for oxygen sensitive analytes. The sampling method is described as follows:

- Measure the static water level using an electronic interface probe and record the thickness of any LNAPL (if encountered);
- Decontaminate the interface probe and cable between monitoring wells by rinsing in a diluted Liquinox solution and then rinsing in demineralised water;
- Fit the pump with a well-dedicated bladder and tubing. Lower the pump into the well then clamp at a level estimated to be 1 m below the top of the water column (provided the depth of the pump is within the screened section) or to the approximate mid-point of the well screen;
- Set the pump at the lowest rate possible that could produce laminar flow to minimise drawdown of the water column;
- Measure physical parameters by continuously passing the purged water through a flow cell; and
- Following stabilisation of the field parameters, collect samples in laboratory-prepared bottles minimising headspace within the sample bottle and cap immediately.

Decontaminate the interface probe, pump and cable between monitoring wells by rinsing in a diluted Liquinox solution and then rinsing in demineralised water.

The general groundwater sample handling and management procedures comprise:

- Collect 10% replicate samples for QC purposes;
- Label sample containers with individual and unique identification details, including project number and sample location;
- Place the sample jars into a cooled, insulated and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

5.0 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 G

Summary Results Tables

Douglas Partners
Geotechnics | Environment | Groundwater

Table G1: Summary of Soil Analysis

			Metals								TRH						BTEX				PAH				Phenol	OCP								
			Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes	Naphthalene [b]	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ	Total PAHs	Phenol	DDD	DDT+DDE+DDD [c]	DDE	DDT	Aldrin & Dieldrin	Total Chlordane	Endrin	Total Endosulfan	Heptachlor
		PQL	4	0.4	1	1	1	0.1	1	1	25	50	25	50	100	100	0.2	0.5	1	1	0.1	0.05	0.5	0.05	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
																										Curre- Investigation Results							
BH100	0 - 0.1 m	07/03/2022	<4	<0.4	5	4	14	<0.1	2	17	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH100	0.5 - 0.6 m	07/03/2022	<4	<0.4	7	3	12	<0.1	2	10	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH101	0.1 - 0.2 m	18/03/2022	<4	<0.4	11	10	25	<0.1	7	31	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH102	0.1 - 0.2 m	18/03/2022	<4	<0.4	10	43	22	<0.1	11	61	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH102	0.4 - 0.5 m	18/03/2022	<4	<0.4	10	13	20	<0.1	6	27	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BD1/322	0 m	01/03/2022	<4	<0.4	21	6	6	<0.1	5	24	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH103	0 - 0.1 m	01/03/2022	6	<0.4	13	19	19	<0.1	9	51	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH103	0.9 - 1 m	01/03/2022	<4	<0.4	8	7	15	<0.1	5	23	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH104	0.4 - 0.5 m	01/03/2022	<4	<0.4	5	5	8	<0.1	2	10	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH104	0.9 - 1 m	01/03/2022	<4	<0.4	69	8	7	<0.1	5	20	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH105	0.4 - 0.5 m	18/03/2022	<4	<0.4	15	5	7	<0.1	4	18	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH105	0.9 - 1 m	18/03/2022	<4	<0.4	2	4	6	<0.1	1	6	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH107	0 - 0.2 m	18/03/2022	<4	<0.4	8	6	18	<0.1	3	26	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH107	0.4-0.6	18/03/2022	<4	<0.4	7	2	10	<0.1	2	9	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH108	0 - 0.2 m	18/03/2022	<4	<0.4	7	7	18	<0.1	3	33	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH109	0.4 - 0.5 m	18/03/2022	<4	<0.4	37	20	9	<0.1	40	37	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	0.1	<5	<0.1	<0.1	<0.1	<0.1	2.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH110	0 - 0.2 m	18/03/2022	<4	<0.4	9	11	15	<0.1	6	34	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH110	0.4 - 0.5 m	18/03/2022	4	<0.4	10	6	10	<0.1	4	18	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH111	0 - 0.2 m	18/03/2022	<4	<0.4	6	7	20	<0.1	3	24	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH111	0.8 - 1.2 m	18/03/2022	<4	<0.4	8	4	21	<0.1	3	19	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	0.3	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BD05	0 m	18/03/2022	<4	<0.4	8	6	27	<0.1	3	26	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	0.3	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH112	0 - 0.2 m	18/03/2022	<4	<0.4	6	8	12	<0.1	5	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH112	0.4 - 0.6 m	18/03/2022	<4	<0.4	7	12	9	<0.1	8	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH113	0 - 0.2 m	18/03/2022	<4	<0.4	8	100	13	<0.1	4	110	<25	120	<25	120	410	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH114	0 - 0.2 m	18/03/2022	<4	<0.4	3	6	8	<0.1	2	21	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH115	0 - 0.2 m	18/03/2022	<4	<0.4	9	7	10	<0.1	5	20	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH115	0.4 - 0.5 m	18/03/2022	<4	<0.4	13	6	9	<0.1	7	15	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BD02	0 m	11-Mar-22 15:00	<5	<1	13	8	11	<0.1	7	23	<10	<50	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH116	0 - 0.2 m	18/03/2022	<4	<0.4	6	8	10	<0.1	4	28	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BD01	0 m	11-Mar-22 15:00	<5	<1	9	8	12	<0.1	4	16	<10	<50	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.5	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH003 - [TRIPLICATE]	0 - 0.1 m	07/03/2022	<4	<0.4	6	3	13	<0.1	2	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
																										DP 2014 Results							
BH1	0.2	26-Sep-14	<4	<0.4	24	12	13	<0.1	21	32	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.1	<0.05	<0.5	Nil +VE	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH2	0.5	26-Sep-14	4	<0.4	14	29	9	<0.1	21	56	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	0.2	<0.05	<0.5	0.18	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH3	0.2	26-Sep-14	<4	<0.4	8	8	22	<0.1	5	43	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.1	<0.05	<0.5	Nil +VE	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH4	0.1	26-Sep-14	9	<0.4	17	19	20	<0.1	5	29	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.1	<0.05	<0.5	Nil +VE	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH5A	0.3	26-Sep-14	<4	<0.4	11	36	13	<0.1	6	31	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.1	<0.05	<0.5	Nil +VE	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH5B	0.5	26-Sep-14	4	<0.4	11	33	15	<0.1	14	66	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.1	<0.05	<0.5	Nil +VE	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH6	0.3	26-Sep-14	<4	<0.4	11	7	9	<0.1	6	30	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.1	<0.05	<0.5	Nil +VE	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH7	0.2	26-Sep-14	<4	<0.4	10	8	26	<0.1	5	29	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.1	<0.05	<0.5	Nil +VE	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -
BH8	0.5	26-Sep-14	<4	<0.4	13	9	21	<0.1	6	23	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.1	<0.05	<0.5	Nil +VE	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	- 240	180	- -	- 180	6 -	50 -	10 -	270 -	6 -

Douglas Partners
Geotechnics | Environment | Groundwater

Table G1: Summary of Soil Analysis

JBS 2019 Results

JBS BH101	0.15-0.25	09-Jan-19	**3.6**	<0.4	**14**	**7.5**	**9.5**	<0.1	**7.7**	**34**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.5	<0.5	Nil +VE	-	<0.05	**0.06**	<0.05	**0.06**	**0.19**	<0.1	<0.05	<0.05	<0.05
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
QA01	0.15-0.25	09-Jan-19	**3.3**	<0.4	**15**	**7.2**	**9**	<0.1	**7.2**	**34**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.5	<0.5	Nil +VE	-	<0.05	<0.05	<0.05	<0.05	**0.22**	<0.05	<0.05	<0.05	<0.05
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
QC01	0.15-0.25	09-Jan-19	**6**	<0.4	**10**	**6**	**6**	**0.1**	**6**	**25**	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<3	<0.1	<0.05	<0.5	Nil +VE	-	<0.1	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH102	0.15-0.25	09-Jan-19	**3.1**	<0.4	**13**	**6.8**	**8**	<0.1	**6.6**	**30**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	-	<0.05	<0.05	<0.05	<0.05	**1**	<0.05	<0.05	<0.05	<0.05
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH102	3-3.1	09-Jan-19	**4.7**	<0.4	**19**	**8.5**	**14**	<0.1	**7.4**	**17**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH103	0.5-0.6	09-Jan-19	**3.4**	<0.4	**17**	**8.1**	**8.9**	<0.1	**8.1**	**63**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.05	<0.5	Nil +VE	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH104	0.1-0.2	09-Jan-19	**3.2**	<0.4	**15**	**6.7**	**7.5**	<0.1	**7.8**	**38**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH104	0.5-0.6	09-Jan-19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.05	<0.5	Nil +VE	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH105	0.3-.04	10-Jan-19	**3.6**	<0.4	**20**	**8.9**	**12**	<0.1	**8**	**39**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH106	0.2-0.3	09-Jan-19	**3.1**	<0.4	**14**	**7.7**	**8**	<0.1	**7.1**	**33**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH107	0.05-0.1	10-Jan-19	**3**	<0.4	**20**	**14**	**14**	<0.1	**19**	**41**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.05	<0.5	Nil +VE	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH108	0.5-0.6	11-Jan-19	<2	<0.4	**5.6**	**<5**	**7.2**	<0.1	**8.3**	**<5**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.05	<0.5	Nil +VE	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH108	2-2.1	11-Jan-19	**7.4**	<0.4	**22**	**11**	**14**	<0.1	**9.8**	**31**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH109	0-0.1	11-Jan-19	9.2	<0.4	**19**	**23**	**17**	<0.1	**8**	**44**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH110	0.3-0.4	10-Jan-19	**3.2**	<0.4	**14**	**8.1**	**7.6**	<0.1	**6.8**	**44**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH110	0-0.1	10-Jan-19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.05	<0.5	Nil +VE	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH111	0.3-0.4	10-Jan-19	**3.3**	<0.4	**16**	**10**	**44**	<0.1	**9.7**	**40**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.05	<0.5	Nil +VE	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH112	0-0.1	11-Jan-19	**3**	<0.4	**9.5**	**7.9**	**19**	<0.1	**<5**	**30**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.05	<0.5	Nil +VE	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH113	0.4-0.5	11-Jan-19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.05	<0.5	Nil +VE	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH113	0-0.1	11-Jan-19	**4**	<0.4	**15**	**11**	**13**	<0.1	**6**	**30**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH114	0-0.1	10-Jan-19	**3**	<0.4	**17**	**13**	**13**	<0.1	**7.8**	**41**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.05	<0.5	Nil +VE	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH115	0.5-0.6	10-Jan-19	-	-	-	-	-	-	-	-	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	<0.05	<0.5	Nil +VE	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH115	0-0.1	10-Jan-19	**3.4**	<0.4	**11**	**19**	**20**	<0.1	**6**	**39**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH116	0.3-0.4	10-Jan-19	**3.9**	<0.4	**15**	**7.7**	**8.8**	<0.1	**8.2**	**38**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -
JBS BH117	0.8-0.9	10-Jan-19	**5.4**	<0.4	**18**	**20**	**9.2**	<0.1	**9.2**	**42**	<20	<50	<20	<50	<100	<100	<0.1	<0.1	<0.1	<0.3	<0.5	-	-	-	-	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 670	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -	- -	240 180	- -	- 180	6 -	50 -	10 -	270 -	6 -

Lab result
HIL/HSL value EIL/ESL value

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

Indicates that asbestos has been detected by the lab, refer to the lab report **Blue** = DC exceedance HSL 0-<1 Exceedance

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

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Manageme- Limit DC = Direct Co-act HSL

Notes:

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

b Reported naphthalene laboratory result obtained from BTEXN suite

c Criteria applies to DDT only

Site Assessme- Criteria (SAC):

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

SAC based on generic land use thresholds for Reside-ial A with garden/accessible soil

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

HSL A/B Reside-ial / Low - High Density (vapour i-rusion) (NEPC, 2013)

DC HSL A Direct co-act HSL A Reside-ial (Low density) (direct co-act) (CRC CARE, 2011)

EIL/ESL UR/POS Urban Reside-ial and Public Open Space (NEPC, 2013)

ML R/P/POS Reside-ial, Parkland and Public Open Space (NEPC, 2013)

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Table G1: Summary of Soil Analysis

					OPP	PCB								Asbestos				PFAS			
			Hexachlorobenzene	Methoxychlor	Chlorpyriphos	Aroclor 1016	Total PCB	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Asbestos ID in soil >0.1g/kg	Trace Analysis	Asbestos (50 g)	Asbestos AF/FA in 500 ml Sample	PFHxS	PFOA	PFOS	PFOS+PFHxS (Calculated)
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1					0.1	0.1	0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	-	-	µg/kg	µg/kg	µg/kg	µg/kg
BH100	0 - 0.1 m	07/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH100	0.5 - 0.6 m	07/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH101	0.1 - 0.2 m	18/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH102	0.1 - 0.2 m	18/03/2022	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH102	0.4 - 0.5 m	18/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BD1/322	0 m	01/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH103	0 - 0.1 m	01/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH103	0.9 - 1 m	01/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH104	0.4 - 0.5 m	01/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	<0.1	<0.1	<0.1	<0.1
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH104	0.9 - 1 m	01/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH105	0.4 - 0.5 m	18/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH105	0.9 - 1 m	18/03/2022	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH107	0 - 0.2 m	18/03/2022	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH107	0.4-0.6	18/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH108	0 - 0.2 m	18/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	<0.1	<0.1	**0.4**	**0.4**
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH109	0.4 - 0.5 m	18/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH110	0 - 0.2 m	18/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH110	0.4 - 0.5 m	18/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH111	0 - 0.2 m	18/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH111	0.8 - 1.2 m	18/03/2022	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BD05	0 m	18/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH112	0 - 0.2 m	18/03/2022	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH112	0.4 - 0.6 m	18/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH113	0 - 0.2 m	18/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	<0.1	<0.1	**1.8**	**1.8**
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH114	0 - 0.2 m	18/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH115	0 - 0.2 m	18/03/2022	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH115	0.4 - 0.5 m	18/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BD02	0 m	11-Mar-22 15:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH116	0 - 0.2 m	18/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	<0.1	<0.1	**0.2**	**0.2**
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BD01	0 m	11-Mar-22 15:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH003 - [TRIPLICATE]	0 - 0.1 m	07/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH1	0.2	26-Sep-14	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH2	0.5	26-Sep-14	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH3	0.2	26-Sep-14	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH4	0.1	26-Sep-14	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH5A	0.3	26-Sep-14	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH5B	0.5	26-Sep-14	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH6	0.3	26-Sep-14	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH7	0.2	26-Sep-14	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -
BH8	0.5	26-Sep-14	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -

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Table G1: Summary of Soil Analysis

JBS BH101	0.15-0.25	09-Jan-19	<0.05	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
QA01	0.15-0.25	09-Jan-19	<0.05	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
QC01	0.15-0.25	09-Jan-19	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH102	0.15-0.25	09-Jan-19	<0.05	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH102	3-3.1	09-Jan-19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH103	0.5-0.6	09-Jan-19	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH104	0.1-0.2	09-Jan-19	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH104	0.5-0.6	09-Jan-19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH105	0.3-.04	10-Jan-19	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH106	0.2-0.3	09-Jan-19	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH107	0.05-0.1	10-Jan-19	<0.05	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH108	0.5-0.6	11-Jan-19	<0.05	<0.05	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH108	2-2.1	11-Jan-19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH109	0-0.1	11-Jan-19	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH110	0.3-0.4	10-Jan-19	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH110	0-0.1	10-Jan-19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH111	0.3-0.4	10-Jan-19	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH112	0-0.1	11-Jan-19	<0.05	<0.05	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH113	0.4-0.5	11-Jan-19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH113	0-0.1	11-Jan-19	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	900 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH114	0-0.1	10-Jan-19	<0.05	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH115	0.5-0.6	10-Jan-19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH115	0-0.1	10-Jan-19	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH116	0.3-0.4	10-Jan-19	<0.05	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		
JBS BH117	0.8-0.9	10-Jan-19	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NAD	-	-	-	-		
			10 -	300 -	160 -	- -	1 -	- -	- -	- -	- -	- -	- -					- -	100 10000	- 1000	10 -		

Lab result
HIL/HSL value EIL/ESL value

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

Indicates that asbestos has been detected by the lab, refer to the lab report Blue = DC exceedance HSL 0-<1 Exceedance

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

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level ML = Manageme- Limit DC = Direct Co-act HSL

Notes:

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

b Reported naphthalene laboratory result obtained from BTEXN suite

c Criteria applies to DDT only

Site Assessme- Criteria (SAC):

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

SAC based on generic land use thresholds for Reside-ial A with garden/accessible soil

HIL A	Reside-ial / Low - High Density (NEPC, 2013)
HSL A/B	Reside-ial / Low - High Density (vapour i-rusion) (NEPC, 2013)
DC HSL A	Direct co-act HSL A Reside-ial (Low density) (direct co-act) (CRC CARE, 2011)
EIL/ESL UR/POS	Urban Reside-ial and Public Open Space (NEPC, 2013)
ML R/P/POS	Reside-ial, Parkland and Public Open Space (NEPC, 2013)

									Field_ID	BD1/20220323	BH100	BH102
									LocCode	BH100	BH100	BH102
									WellCode			
									Sampled_Date-Time	23/03/2022	23/03/2022	23/03/2022
				ANZG (2018) Freshwater 95% LOSP Toxicant DGVs	ANZG (2018) Freshwater Unknown LOSP Toxicant DGVs	PFOS 95% LOP Fresh Water	PFOS 99% LOP Fresh Water	NEPM 2013 Table 2-4m	NEPM 2013 Table 1C GILs, Drinking Water			
Method_Type	**ChemName**	**Units**	**EQL**									
HM in water - dissolved	Arsenic (Filtered)	mg/L	**0.001**	0.024					0.01	<0.001	<0.001	**0.001**
	Cadmium (Filtered)	mg/L	**0.0001**	0.0002					0.002	<0.0001	<0.0001	<0.0001
	Chromium (III+VI) (Filtered)	mg/L	**0.001**	0.0033						<0.001	<0.001	<0.001
	Copper (Filtered)	mg/L	**0.001**	0.0014					2	**0.005**	**0.013**	**0.032**
	Lead (Filtered)	mg/L	**0.001**	0.0034					0.01	<0.001	<0.001	<0.001
	Mercury (Filtered)	mg/L	**0.00005**	0.0006					0.001	<0.00005	<0.00005	<0.00005
	Nickel (Filtered)	mg/L	**0.001**	0.011					0.02	<0.001	<0.001	**0.006**
	Zinc (Filtered)	mg/L	**0.001**	0.008						**0.004**	**0.005**	**0.013**
OCPs in Water - Trace Level	4,4-DDE	mg/L	**0.0000001**							-	<0.000002	<0.000001
	a-BHC	mg/L	**0.0000001**							-	<0.000002	<0.000001
	Aldrin	mg/L	**0.0000001**		0.000001					-	<0.000002	<0.000001
	b-BHC	mg/L	**0.0000001**							-	<0.000002	<0.000001
	Chlordane (cis)	mg/L	**0.0000001**							-	<0.000002	<0.000001
	Chlordane (trans)	mg/L	**0.0000001**							-	<0.000002	<0.000001
	d-BHC	mg/L	**0.0000001**							-	<0.000002	<0.000001
	DDD	mg/L	**0.0000001**							-	<0.000002	<0.000001
	DDT	mg/L	**0.0000001**	0.00001					0.009	-	<0.000002	<0.000001
	Dieldrin	mg/L	**0.0000001**		0.00001					-	<0.000002	<0.000001
	Endosulfan I	mg/L	**0.0000002**							-	<0.000004	<0.000002
	Endosulfan II	mg/L	**0.0000002**							-	<0.000004	<0.000002
	Endosulfan sulphate	mg/L	**0.0000001**							-	<0.000002	<0.000001
	Endrin	mg/L	**0.0000001**	0.00002						-	<0.000002	<0.000001
	Endrin aldehyde	mg/L	**0.0000001**							-	<0.000002	<0.000001
	g-BHC (Lindane)	mg/L	**0.0000001**	0.0002					0.01	-	<0.000002	<0.000001
	Heptachlor	mg/L	**0.0000001**	0.00009						-	<0.000002	<0.000001
	Heptachlor epoxide	mg/L	**0.0000001**						0.0003	-	<0.000002	<0.000001
	Hexachlorobenzene	mg/L	**0.0000001**	0.0001						-	<0.000002	<0.000001
	Methoxychlor	mg/L	**0.0000001**		0.000004					-	<0.000002	<0.000001
OP in water Trace ANZECCF/ADWG	Azinophos methyl	mg/L	**0.00002**	0.00002					0.03	-	<0.00004	<0.00002
	Bromophos-ethyl	mg/L	**0.0002**							-	<0.0004	<0.0002
	Chlorpyrifos	mg/L	**0.000009**	0.00001					0.01	-	<0.00002	<0.000009
	Chlorpyrifos-methyl	mg/L	**0.0002**							-	<0.0004	<0.0002
	Diazinon	mg/L	**0.00001**	0.00001					0.004	-	<0.00002	<0.00001
	Dichlorvos	mg/L	**0.0002**						0.005	-	<0.0004	<0.0002
	Dimethoate	mg/L	**0.00015**	0.00015					0.007	-	<0.0003	<0.00015
	Ethion	mg/L	**0.0002**						0.004	-	<0.0004	<0.0002
	Fenitrothion	mg/L	**0.0002**	0.0002					0.007	-	<0.0004	<0.0002
	Malathion	mg/L	**0.00005**	0.00005					0.07	-	<0.0001	<0.00005
	Methyl parathion	mg/L	**0.0002**						0.0007	-	<0.0004	<0.0002
	Parathion	mg/L	**0.000004**	0.000004					0.02	-	<0.000008	<0.000004
	Ronnel	mg/L	**0.0002**							-	<0.0004	<0.0002
PAHs in Water - Low Level	Acenaphthene	mg/L	**0.0001**							<0.0001	<0.0002	<0.0001
	Acenaphthylene	mg/L	**0.0001**							<0.0001	<0.0002	<0.0001
	Anthracene	mg/L	**0.0001**	0.0004						<0.0001	<0.0002	<0.0001
	Benz(a)anthracene	mg/L	**0.0001**							<0.0001	<0.0002	<0.0001
	Benzo(a) pyrene	mg/L	**0.0001**	0.0002					0.00001	<0.0001	<0.0002	<0.0001
	Benzo(a)pyrene TEQ	µg/L	**0.5**							<0.5	<1	<0.5
	Benzo(b,j+k)fluoranthene	µg/L	**0.2**							<0.2	<0.4	<0.2
	Benzo(g,h,i)perylene	mg/L	**0.0001**							<0.0001	<0.0002	<0.0001
	Chrysene	mg/L	**0.0001**							<0.0001	<0.0002	<0.0001
	Dibenz(a,h)anthracene	mg/L	**0.0001**							<0.0001	<0.0002	<0.0001
	Fluoranthene	mg/L	**0.0001**	0.0014						<0.0001	<0.0002	<0.0001
	Fluorene	mg/L	**0.0001**							<0.0001	<0.0002	<0.0001
	Indeno(1,2,3-c,d)pyrene	mg/L	**0.0001**							<0.0001	<0.0002	<0.0001
	Naphthalene	mg/L	**0.0002**	0.016				NL		<0.0002	<0.0004	<0.0002
	Phenanthrene	mg/L	**0.0001**	0.002						<0.0001	<0.0002	<0.0001
	Pyrene	mg/L	**0.0001**							<0.0001	<0.0002	<0.0001
	Total +ve PAHs	µg/L	**0.1**							<0.1	<0.2	<0.1
PCBs in Water - Trace Level	Arochlor 1016	mg/L	**0.00001**							-	<0.00002	<0.00001
	Arochlor 1221	mg/L	**0.00001**							-	<0.00002	<0.00001
	Arochlor 1232	mg/L	**0.00001**							-	<0.00002	<0.00001
	Arochlor 1242	mg/L	**0.00001**	0.0006						-	<0.00002	<0.00001
	Arochlor 1248	mg/L	**0.00001**							-	<0.00002	<0.00001
	Arochlor 1254	mg/L	**0.00001**	0.00003						-	<0.00002	<0.00001
	Arochlor 1260	mg/L	**0.00001**							-	<0.00002	<0.00001
PFAS in Water LOW LEVEL Extend	10:2 FTS	µg/L	**0.002**							-	<0.002	<0.002
	4:2 FTS	µg/L	**0.001**							-	<0.001	<0.001
	8:2 FTS	µg/L	**0.002**							-	<0.002	<0.002
	EtPerfluorooctanesulf- amid oacetic acid	µg/L	**0.002**							-	<0.002	<0.002
	MePerfluorooctanesulf- amid oacetic acid	µg/L	**0.002**							-	<0.002	<0.002
	N-Et perfluorooctanesulfonamid oethanol	µg/L	**0.05**							-	<0.05	<0.05
	N-Ethyl perfluorooctanesulfon amide	µg/L	**0.01**							-	<0.01	<0.01
	N-Me perfluorooctanesulfonamid oethanol	µg/L	**0.005**							-	<0.005	<0.005
	N-Methyl perfluorooctane sulfonamide	µg/L	**0.005**							-	<0.005	<0.005
	6:2 Fluorotelomer Sulfonate (6.2 FTS)	mg/L	**0.000001**							-	<0.000001	**0.000002**
	Perfluorobutanesulfonic acid	µg/L	**0.001**							-	**0.009**	**0.01**
	Perfluorobutanoic acid	µg/L	**0.002**							-	**0.008**	**0.028**
	Perfluorodecanesulfonic acid	µg/L	**0.002**							-	<0.002	<0.002
	Perfluorodecanoic acid	µg/L	**0.002**							-	<0.002	<0.002
	Perfluorododecanoic acid	µg/L	**0.005**							-	<0.005	<0.005
	Perfluoroheptanesulfonic acid	µg/L	**0.001**							-	<0.001	<0.001
	Perfluoroheptanoic acid	µg/L	**0.001**							-	<0.001	**0.018**
	Perfluorohexanesulfonic acid - PFHxS	µg/L	**0.001**							-	**0.014**	**0.032**
	Perfluorohexanoic acid - PFOA	µg/L	**0.001**			220	19			-	**0.002**	**0.032**
	Perfluorononanoic acid	µg/L	**0.001**							-	<0.001	**0.001**
	Perfluorooctane sulfonamide	µg/L	**0.01**							-	<0.01	<0.01
	Perfluorooctanesulfonic acid PFOS	µg/L	**0.001**			0.13	0.00023			-	**0.003**	**0.015**
	Perfluorooctanoate	mg/L	**0.000001**							-	**0.000002**	**0.000028**
	Perfluoropentanesulfonic acid	µg/L	**0.001**							-	**0.003**	**0.003**
	Perfluoropentanoic acid	µg/L	**0.002**							-	**0.003**	**0.035**
	Perfluorotetradecanoic acid	µg/L	**0.05**							-	<0.05	<0.05
	Perfluorotridecanoic acid	µg/L	**0.01**							-	<0.01	<0.01
	Perfluoroundecanoic acid	µg/L	**0.002**							-	<0.002	<0.002
	Total Positive PFAS	µg/L	**0.001**							-	**0.046**	**0.2**
	Total Positive PFHxS & PFOS	µg/L	**0.001**							-	**0.017**	**0.047**
	Total Positive PFOA & PFOS	µg/L	**0.001**								**0.006**	**0.043**
svTRH (C10-C40) in Water	C10-C16	mg/L	**0.05**							**0.074**	<0.1	<0.05
	C16-C34	mg/L	**0.1**							**0.32**	<0.2	**0.12**
	C34-C40	mg/L	**0.1**							<0.1	<0.2	<0.1
	F2-NAPHTHALENE	mg/L	**0.05**					1		**0.074**	<0.1	<0.05
	C10 - C14	mg/L	**0.05**							**0.071**	<0.1	<0.05
	C15 - C28	mg/L	**0.1**							**0.24**	<0.2	<0.1
	C29-C36	mg/L	**0.1**							**0.14**	<0.2	<0.1
	+C10 - C36 (Sum of total)	mg/L	**0.05**							**0.45**	<0.1	<0.05
	C10 - C40 (Sum of total)	mg/L	**0.05**							**0.39**	<0.1	**0.12**
Total Phenolics in Water	Phenolics Total	mg/L	**0.05**							-	<0.05	<0.05
vTRH(C6-C10)/BTEXN in Water	Benzene	mg/L	**0.001**	0.95				0.8	0.001	<0.001	<0.001	<0.001
	Ethylbenzene	mg/L	**0.001**	0.08				NL	0.3	<0.001	<0.001	<0.001
	Naphthalene	mg/L	**0.001**	0.016				NL		<0.001	<0.001	<0.001
	C6 - C9	mg/L	**0.01**							<0.01	<0.01	<0.01
	Toluene	mg/L	**0.001**	0.18				NL	0.8	<0.001	<0.001	<0.001
	Xylene (m & p)	mg/L	**0.002**							<0.002	<0.002	<0.002
	Xylene (o)	mg/L	**0.001**	0.35						<0.001	<0.001	<0.001
	C6-C10 less BTEX (F1)	mg/L	**0.01**					1		<0.01	<0.01	<0.01
	C6-C10	mg/L	**0.01**							<0.01	<0.01	<0.01

Douglas Partners
Geotechnics / Environment / Groundwater

Table G3: Summary of Waste Classification Assessment

				Metals								TRH					BTEX						PAH	
			Soil Type	Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	TRH C6 - C9	TRH C10 - C14	TRH C15 - C28	TRH C29 - C36	C10-C36 recoverable hydrocarbons	Benzene	Toluene	Ethylbenzene	m+p-Xylene	o-Xylene	Xylenes (total)	Benzo(a)pyrene (BaP)	Total PAHs
		PQL		4	0.4	1	1	1	0.1	1	1	25	50	100	100	50	0.2	0.5	1	2	1	1	0.05	0.05
Sample ID	Depth	Sample Date		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
Curre- Results																								
BH100	0 - 0.1 m	07/03/2022	Fill	<4	<0.4	5	4	14	<0.1	2	17	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH100	0.5 - 0.6 m	07/03/2022	Clayey Sand	<4	<0.4	7	3	12	<0.1	2	10	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH101	0.1 - 0.2 m	18/03/2022	Fill	<4	<0.4	11	10	25	<0.1	7	31	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH102	0.1 - 0.2 m	18/03/2022	Fill	<4	<0.4	10	43	22	<0.1	11	61	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH102	0.4 - 0.5 m	18/03/2022	Fill	<4	<0.4	10	13	20	<0.1	6	27	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH103	0 - 0.1 m	01/03/2022	Fill	6	<0.4	13	19	19	<0.1	9	51	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH103	0.9 - 1 m	01/03/2022	Silty Clay	<4	<0.4	8	7	15	<0.1	5	23	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH104	0.4 - 0.5 m	01/03/2022	Fill	<4	<0.4	5	5	8	<0.1	2	10	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH104	0.9 - 1 m	01/03/2022	Fill	<4	<0.4	69	8	7	<0.1	5	20	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BD1/322	0 m	01/03/2022	Fill	<4	<0.4	21	6	6	<0.1	5	24	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH105	0.4 - 0.5 m	18/03/2022	Fill	<4	<0.4	15	5	7	<0.1	4	18	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH105	0.9 - 1 m	18/03/2022	Fill	<4	<0.4	2	2	4	<0.1	1	6	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH107	0 - 0.2 m	18/03/2022	Fill	<4	<0.4	8	6	18	<0.1	3	26	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH107	0.4-0.6	18/03/2022	Fill	<4	<0.4	7	2	10	<0.1	2	9	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH108	0 - 0.2 m	18/03/2022	Fill	<4	<0.4	7	7	18	<0.1	3	33	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH109	0.4 - 0.5 m	18/03/2022	Fill	<4	<0.4	37	20	9	<0.1	40	37	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	0.1
BH110	0 - 0.2 m	18/03/2022	Fill	<4	<0.4	9	11	15	<0.1	6	34	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH110	0.4 - 0.5 m	18/03/2022	Clay	4	<0.4	10	6	10	<0.1	4	18	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH111	0 - 0.2 m	18/03/2022	Fill	<4	<0.4	6	7	20	<0.1	3	24	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH111	0.8 - 1.2 m	18/03/2022	Fill	<4	<0.4	8	4	21	<0.1	3	19	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	0.3
BD05	0 m	18/03/2022	Fill	<4	<0.4	8	6	27	<0.1	3	26	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	0.3
BH112	0 - 0.2 m	18/03/2022	Fill	<4	<0.4	6	8	12	<0.1	5	21	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH112	0.4 - 0.6 m	18/03/2022	Fill	<4	<0.4	7	12	9	<0.1	8	21	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH113	0 - 0.2 m	18/03/2022	Fill	<4	<0.4	8	100	13	<0.1	4	110	<25	<50	280	270	550	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH114	0 - 0.2 m	18/03/2022	Fill	<4	<0.4	3	6	8	<0.1	2	21	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH115	0 - 0.2 m	18/03/2022	Fill	<4	<0.4	9	7	10	<0.1	5	20	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BH115	0.4 - 0.5 m	18/03/2022	Fill	<4	<0.4	13	6	9	<0.1	7	15	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BD02	0 m	11-Mar-22 15:00	Fill	<5	<1	13	8	11	<0.1	7	23	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
BH116	0 - 0.2 m	18/03/2022	Fill	<4	<0.4	6	8	10	<0.1	4	28	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05
BD01	0 m	11-Mar-22 15:00	Fill	<5	<1	9	8	12	<0.1	4	16	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-
DP 2014 Results																								
BH1	0.2	26/09/2014	Fill	<4	<0.4	24	12	13	<0.1	21	32	<25	<50	<100	<100	<250	<0.2	<0.5	<1	<1	<2	<3	<0.05	Nil +VE
BH2	0.5	26/09/2014	Fill	4	<0.4	14	29	9	<0.1	21	56	<25	<50	<100	<100	<250	<0.2	<0.5	<1	<1	<2	<3	<0.05	Nil +VE
BH3	0.2	26/09/2014	Fill	<4	<0.4	8	8	22	<0.1	5	43	<25	<50	<100	<100	<250	<0.2	<0.5	<1	<1	<2	<3	<0.05	Nil +VE
BH4	0.1	26/09/2014	Fill	9	<0.4	17	19	20	<0.1	5	29	<25	<50	<100	<100	<250	<0.2	<0.5	<1	<1	<2	<3	<0.05	Nil +VE
BH5A	0.3	26/09/2014	Fill	<4	<0.4	11	36	13	<0.1	6	31	<25	<50	<100	<100	<250	<0.2	<0.5	<1	<1	<2	<3	<0.05	Nil +VE
BH5B	0.5	26/09/2014	Fill	4	<0.4	11	33	15	<0.1	14	66	<25	<50	<100	<100	<250	<0.2	<0.5	<1	<1	<2	<3	<0.05	Nil +VE
BH6	0.3	26/09/2014	Sand	<4	<0.4	11	7	9	<0.1	6	30	<25	<50	<100	<100	<250	<0.2	<0.5	<1	<1	<2	<3	<0.05	Nil +VE
BH7	0.2	26/09/2014	Silty Clay	<4	<0.4	10	8	26	<0.1	5	29	<25	<50	<100	<100	<250	<0.2	<0.5	<1	<1	<2	<3	<0.05	Nil +VE
BH8	0.5	26/09/2014	Fill	<4	<0.4	13	9	21	<0.1	6	23	<25	<50	<100	<100	<250	<0.2	<0.5	<1	<1	<2	<3	<0.05	Nil +VE
JBS (2019) Results																								
BH101 0.15-0.25	0.15-0.25	9/01/2019	Fill	3.6	<0.4	14	7.5	9.5	<0.1	7.7	34	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	Nil +VE
QA01	0.15-0.25	9/01/2019	Fill	3.3	<0.4	15	7.2	9	<0.1	7.2	34	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	Nil +VE
QC01	0.15-0.25	9/01/2019	Fill	6	<0.4	10	6	6	0.1	6	25	<25	<50	<100	<100	-	<0.2	<0.5	<1	<1	<2	<1	<0.05	Nil +VE
BH102 0.15-0.25	0.15-0.25	9/01/2019	Fill	3.1	<0.4	13	6.8	8	<0.1	6.6	30	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	-	-
BH102 3.0-3.1	3-3.1	9/01/2019	Fill	4.7	<0.4	19	8.5	14	<0.1	7.4	17	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	-	-
BH103 0.5-0.6	0.5-0.6	9/01/2019	Fill	3.4	<0.4	17	8.1	8.9	<0.1	8.1	63	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	Nil +VE
BH104 0.1-0.2	0.1-0.2	9/01/2019	Fill	3.2	<0.4	15	6.7	7.5	<0.1	7.8	38	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3		
BH104 0.5-0.6	0.5-0.6	9/01/2019	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	Nil +VE
BH105 0.3-0.4	0.3-0.4	10/01/2019	Fill	3.6	<0.4	20	8.9	12	<0.1	8	39	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	-	-
BH106 0.2-0.3	0.2-0.3	9/01/2019	Fill	3.1	<0.4	14	7.7	8	<0.1	7.1	33	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	-	-
BH107 0.05-0.1	0.05-0.1	10/01/2019	Fill	3	<0.4	20	14	14	<0.1	19	41	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	Nil +VE
BH108 0.5-0.6	0.5-0.6	11/01/2019	Fill	<2	<0.4	5.6	<5	7.2	<0.1	8.3	<5	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	Nil +VE
BH108 2-2.1	2-2.1	11/01/2019	Clay	7.4	<0.4	22	11	14	<0.1	9.8	31	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	-	-
BH109 0-0.1	0-0.1	11/01/2019	Fill	9.2	<0.4	19	23	17	<0.1	8	44	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	-	-
BH110 0.3-0.4	0.3-0.4	10/01/2019	Fill	3.2	<0.4	14	8.1	7.6	<0.1	6.8	44	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	-	-
BH110 0-0.1	0-0.1	10/01/2019	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	Nil +VE
BH111 0.3-0.4	0.3-0.4	10/01/2019	Fill	3.3	<0.4	16	10	44	<0.1	9.7	40	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	Nil +VE
BH112 0-0.1	0-0.1	11/01/2019	Fill	3	<0.4	9.5	7.9	19	<0.1	<5	30	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	Nil +VE
BH113 0.4-0.5	0.4-0.5	11/01/2019	Fill	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	Nil +VE
BH113 0-0.1	0-0.1	11/01/2019	Fill	4	<0.4	15	11	13	<0.1	6	30	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	-	-
BH114 0-0.1	0-0.1	10/01/2019	Fill	3	<0.4	17	13	13	<0.1	7.8	41	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	Nil +VE
BH115 0.5-0.6	0.5-0.6	10/01/2019	Fill	-	-	-	-	-	-	-	-	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	<0.5	Nil +VE
BH115 0-0.1	0-0.1	10/01/2019	Fill	3.4	<0.4	11	19	20	<0.1	6	39	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116 0.3-0.4	0.3-0.4	10/01/2019	Fill	3.9	<0.4	15	7.7	8.8	<0.1	8.2	38	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	-	-
BH117 0.8-0.9	0.8-0.9	10/01/2019	Fill	5.4	<0.4	18	20	18	<0.1	9.2	42	<20	<20	<50	<50	<50	<0.1	<0.1	<0.1	<0.1	<0.2	<0.3	-	-
Waste Classification Criteria [f]																								
CT1				100	20	100	NC	100	4	40	NC	650	NC	NC	NC	10000	10	288	600	NC	NC	1000	0.8	200
SCC1				500	100	1900	NC	1500	50	1050	NC	650	NC	NC	NC	10000	18	518	1080	NC	NC	1800	10	200
TCLP1				N/A	N/A	N/A	NC	N/A	N/A	N/A	NC	N/A	NC	NC	NC	N/A	N/A	N/A	N/A	NC	NC	N/A	N/A	N/A
CT2				400	80	400	NC	400	16	160	NC	2600	NC	NC	NC	40000	40	1152	2400	NC	NC	4000	3.2	800
SCC2				2000	400	7600	NC	6000	200	4200	NC	2600	NC	NC	NC	40000	72	2073	4320	NC	NC	7200	23	800
TCLP2				N/A	N/A	N/A	NC	N/A	N/A	N/A	NC	N/A	NC	NC	NC	N/A	N/A	N/A	N/A	NC	NC	N/A	N/A	N/A
Screening Levels for Natural Soils																								
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													

		Phenol	OCP		OPP	PCB								Asbestos			PFAS							
		Phenol	Total Endosulfan	Total Analysed OCP	Total Analysed OPP	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Aroclor 1260	Total PCB	Asbestos ID in soil >0.1g/kg	Trace Analysis	Total Asbestos	PFHxS	PFOA	TCLP PFHxS	PFHxS	TCLP PFOA	TCLP PFHxS	PFOS+PFHxS (Calculated)	TCLP PFOS+PFHxS (Calculated)
		5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1				0.1	0.1	0.01	0.1	0.01	0.01	0.1	0.01
Sample ID	Depth	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	-	µg/kg	µg/kg	µg/l	µg/kg	µg/l	µg/l	µg/kg	µg/l
Curre- Results																								
BH100	0 - 0.1 m	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH100	0.5 - 0.6 m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH101	0.1 - 0.2 m	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH102	0.1 - 0.2 m	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH102	0.4 - 0.5 m	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH103	0 - 0.1 m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH103	0.9 - 1 m	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH104	0.4 - 0.5 m	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	<0.1	<0.1	<0.01	<0.1	<0.01	<0.01	<0.1	<0.01
BH104	0.9 - 1 m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD1/322	0 m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH105	0.4 - 0.5 m	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH105	0.9 - 1 m	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH107	0 - 0.2 m	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH107	0.4-0.6	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH108	0 - 0.2 m	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	0.4	<0.1	<0.01	<0.1	<0.01	<0.01	0.4	<0.01
BH109	0.4 - 0.5 m	<5	<0.1	2.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH110	0 - 0.2 m	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH110	0.4 - 0.5 m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH111	0 - 0.2 m	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH111	0.8 - 1.2 m	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BD05	0 m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH112	0 - 0.2 m	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH112	0.4 - 0.6 m	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH113	0 - 0.2 m	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	1.8	0.2	0.01	<0.1	<0.01	<0.01	1.8	0.01
BH114	0 - 0.2 m	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH115	0 - 0.2 m	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH115	0.4 - 0.5 m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BD02	0 m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH116	0 - 0.2 m	<5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	0.2	<0.1	0.01	<0.1	<0.01	<0.01	0.2	0.01
BD01	0 m	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DP 2014 Results																								
BH1	0.2	<5	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH2	0.5	<5	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH3	0.2	<5	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH4	0.1	<5	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH5A	0.3	<5	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH5B	0.5	<5	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH6	0.3	<5	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH7	0.2	<5	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH8	0.5	<5	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
JBS (2019) Results																								
BH101 0.15-0.25	0.15-0.25	-	<0.05	0.25	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
QA01	0.15-0.25	-	<0.05	0.22	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
QC01	0.15-0.25	-	<0.1	<0.1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
BH102 0.15-0.25	0.15-0.25	-	<0.05	1	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-	-	-	-	-
BH102 3.0-3.1	3-3.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH103 0.5-0.6	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH104 0.1-0.2	0.1-0.2	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH104 0.5-0.6	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH105 0.3-0.4	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH106 0.2-0.3	0.2-0.3	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH107 0.05-0.1	0.05-0.1	-	<0.05	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH108 0.5-0.6	0.5-0.6	-	<0.05	<0.05	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH108 2-2.1	2-2.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH109 0-0.1	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH110 0.3-0.4	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH110 0-0.1	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH111 0.3-0.4	0.3-0.4	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH112 0-0.1	0-0.1	-	<0.05	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH113 0.4-0.5	0.4-0.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH113 0-0.1	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH114 0-0.1	0-0.1	-	<0.05	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH115 0.5-0.6	0.5-0.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH115 0-0.1	0-0.1	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH116 0.3-0.4	0.3-0.4	-	<0.05	<0.05	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	NAD	-	-	-	-	-	-	-	-
BH117 0.8-0.9	0.8-0.9	-	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	-	-	-	-	-	-	-	-
Waste Classification Criteria [f]																								
CT1		288	60	<50	4	NC	NC	NC	NC	NC	NC	NC	<50	NC	NC	NC	NC	N/A	NC	NC	N/A	NC	N/A	N/A
SCC1		518	108	<50	7.5	NC	NC	NC	NC	NC	NC	NC	<50	NC	NC	NC	NC	18000	NC	NC	N/A	NC	1800	N/A
TCLP1		N/A	N/A	N/A	N/A	NC	NC	NC	NC	NC	NC	NC	N/A	NC	NC	NC	NC	N/A	NC	NC	500	NC	N/A	50
CT2		1152	240	<50	16	NC	NC	NC	NC	NC	NC	NC	<50	NC	NC	NC	NC	N/A	NC	NC	N/A	NC	N/A	N/A
SCC2		2073	432	<50	30	NC	NC	NC	NC	NC	NC	NC	<50	NC	NC	NC	NC	72000	NC	NC	N/A	NC	7200	N/A
TCLP2		N/A	N/A	N/A	N/A	NC	NC	NC	NC	NC	NC	NC	N/A	NC	NC	NC	NC	N/A	NC	NC	2000	NC	N/A	200
Screening Levels for Natural Soils																								
NEPC (1999)																								
ANZECC (1992)																								
ANZECC (2000)																								

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

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

Notes:

a	QA/QC replicate of sample listed directly below the primary sample
b	Total chromium used as initial screen for chromium(VI).
c	Total recoverable hydrocarbons (TRH) used as an initial screen for total petroleum hydrocarbons (TPH)
d	Criteria for scheduled chemicals used as an initial screen
e	Criteria for Chlorpyrifos used as initial screen
f	All criteria are in the same units as the reported results
PQL	Practical qua-itation limit
CT1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific co-amina- conce-ration (SCC) for classification without TCLP: General solid waste
SCC1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable conce-ration (TCLP) and specific co-amina- conce-ration (SCC) when used together: General solid waste
TCLP1	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable conce-ration (TCLP) and specific co-amina- conce-ration (SCC) when used together: General solid waste
CT2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values of specific co-amina- conce-ration (SCC) for classification without TCLP: Restricted solid waste
SCC2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable conce-ration (TCLP) and specific co-amina- conce-ration (SCC) when used together: Restricted solid waste
TCLP2	NSW EPA, 2014, Waste Classification Guidelines Part 1; Classifying Waste, Maximum values for leachable conce-ration (TCLP) and specific co-amina- conce-ration (SCC) when used together: Restricted solid waste

NEPC (1999) *National Environment Protection Measure (Assessment of Site Contamination)* Schedule B1, Table 5-A, Background Ranges

ANZECC/NHMRC (1992) *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites* , Environmental Soil Quality Guidelines Background A [ANZECC A];

ANZECC (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* , Volume 3, Table 9.2.16 Datasets used to derive suggested upper background values for uncontaminated Australian soils

UCL Statistics for Uncensored Full Data Sets

User Selected Options	
Date/Time of Computation	ProUCL 5.113/05/2022 4:36:23 PM
From File	WorkSheet.xls
Full Precision	OFF
Confidence Coefficient	95%
Number of Bootstrap Operations	2000

F2

General Statistics

Total Number of Observations	58	Number of Distinct Observations	2
		Number of Missing Observations	0
Minimum	50	Mean	51.21
Maximum	120	Median	50
SD	9.191	Std. Error of Mean	1.207
Coefficient of Variation	0.179	Skewness	7.616

Normal GOF Test

Shapiro Wilk Test Statistic	0.133	**Shapiro Wilk GOF Test**
5% Shapiro Wilk P Value	0	Data Not Normal at 5% Significance Level
Lilliefors Test Statistic	0.535	**Lilliefors GOF Test**
5% Lilliefors Critical Value	0.116	Data Not Normal at 5% Significance Level

Data Not Normal at 5% Significance Level

Assuming Normal Distribution

95% Normal UCL		95% UCLs (Adjusted for Skewness)	
95% Student's-t UCL	53.22	95% Adjusted-CLT UCL (Chen-1995)	54.48
		95% Modified-t UCL (Johnson-1978)	53.43

Gamma GOF Test

A-D Test Statistic	22.01	**Anderson-Darling Gamma GOF Test**
5% A-D Critical Value	0.748	Data Not Gamma Distributed at 5% Significance Level
K-S Test Statistic	0.537	**Kolmogorov-Smirnov Gamma GOF Test**
5% K-S Critical Value	0.116	Data Not Gamma Distributed at 5% Significance Level

Data Not Gamma Distributed at 5% Significance Level

Gamma Statistics

k hat (MLE)	57.26	k star (bias corrected MLE)	54.31
Theta hat (MLE)	0.894	Theta star (bias corrected MLE)	0.943
nu hat (MLE)	6643	nu star (bias corrected)	6300
MLE Mean (bias corrected)	51.21	MLE Sd (bias corrected)	6.948
		Approximate Chi Square Value (0.05)	6117
Adjusted Level of Significance	0.0459	Adjusted Chi Square Value	6112

Assuming Gamma Distribution

95% Approximate Gamma UCL (use when n>=50))	52.74	95% Adjusted Gamma UCL (use when n<50)	52.78

Lognormal GOF Test

Shapiro Wilk Test Statistic	0.133	**Shapiro Wilk Lognormal GOF Test**
5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level
Lilliefors Test Statistic	0.535	**Lilliefors Lognormal GOF Test**

55	5% Lilliefors Critical Value					0.116	Data Not Lognormal at 5% Significance Level					
56	**Data Not Lognormal at 5% Significance Level**											
57												
58	**Lognormal Statistics**											
59	Minimum of Logged Data					3.912	Mean of logged Data					3.927
60	Maximum of Logged Data					4.787	SD of logged Data					0.115
61												
62	**Assuming Lognormal Distribution**											
63	95% H-UCL					52.43	90% Chebyshev (MVUE) UCL					53.41
64	95% Chebyshev (MVUE) UCL					54.46	97.5% Chebyshev (MVUE) UCL					55.92
65	99% Chebyshev (MVUE) UCL					58.79						
66												
67	**Nonparametric Distribution Free UCL Statistics**											
68	**Data do not follow a Discernible Distribution (0.05)**											
69												
70	**Nonparametric Distribution Free UCLs**											
71	95% CLT UCL					53.19	95% Jackknife UCL					N/A
72	95% Standard Bootstrap UCL					N/A	95% Bootstrap-t UCL					N/A
73	95% Hall's Bootstrap UCL					N/A	95% Percentile Bootstrap UCL					N/A
74	95% BCA Bootstrap UCL					N/A						
75	90% Chebyshev(Mean, Sd) UCL					54.83	95% Chebyshev(Mean, Sd) UCL					56.47
76	97.5% Chebyshev(Mean, Sd) UCL					58.74	99% Chebyshev(Mean, Sd) UCL					63.22
77												
78	**Suggested UCL to Use**											
79	95% Student's-t UCL					53.22	or 95% Modified-t UCL					53.43
80												
81	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
82	Recommendations are based upon data size, data distribution, and skewness.											
83	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
84	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
85												
86												
87	**F3**											
88												
89	**General Statistics**											
90	Total Number of Observations					58	Number of Distinct Observations					2
91							Number of Missing Observations					0
92	Minimum					100	Mean					105.3
93	Maximum					410	Median					100
94	SD					40.7	Std. Error of Mean					5.345
95	Coefficient of Variation					0.386	Skewness					7.616
96												
97	**Normal GOF Test**											
98	Shapiro Wilk Test Statistic					0.133	**Shapiro Wilk GOF Test**					
99	5% Shapiro Wilk P Value					0	Data Not Normal at 5% Significance Level					
100	Lilliefors Test Statistic					0.535	**Lilliefors GOF Test**					
101	5% Lilliefors Critical Value					0.116	Data Not Normal at 5% Significance Level					
102	**Data Not Normal at 5% Significance Level**											
103												
104	**Assuming Normal Distribution**											
105	**95% Normal UCL**						**95% UCLs (Adjusted for Skewness)**					
106	95% Student's-t UCL					114.3	95% Adjusted-CLT UCL (Chen-1995)					119.8
107							95% Modified-t UCL (Johnson-1978)					115.2
108												

109	**Gamma GOF Test**											
110					A-D Test Statistic	22.06	**Anderson-Darling Gamma GOF Test**					
111					5% A-D Critical Value	0.749	Data Not Gamma Distributed at 5% Significance Level					
112					K-S Test Statistic	0.539	**Kolmogorov-Smirnov Gamma GOF Test**					
113					5% K-S Critical Value	0.117	Data Not Gamma Distributed at 5% Significance Level					
114	**Data Not Gamma Distributed at 5% Significance Level**											
115												
116	**Gamma Statistics**											
117					k hat (MLE)	18.19	k star (bias corrected MLE)	17.26				
118					Theta hat (MLE)	5.792	Theta star (bias corrected MLE)	6.104				
119					nu hat (MLE)	2110	nu star (bias corrected)	2002				
120					MLE Mean (bias corrected)	105.3	MLE Sd (bias corrected)	25.36				
121							Approximate Chi Square Value (0.05)	1899				
122					Adjusted Level of Significance	0.0459	Adjusted Chi Square Value	1897				
123												
124	**Assuming Gamma Distribution**											
125				95% Approximate Gamma UCL (use when n>=50))		111.1	95% Adjusted Gamma UCL (use when n<50)	111.2				
126												
127	**Lognormal GOF Test**											
128					Shapiro Wilk Test Statistic	0.133	**Shapiro Wilk Lognormal GOF Test**					
129					5% Shapiro Wilk P Value	0	Data Not Lognormal at 5% Significance Level					
130					Lilliefors Test Statistic	0.535	**Lilliefors Lognormal GOF Test**					
131					5% Lilliefors Critical Value	0.116	Data Not Lognormal at 5% Significance Level					
132	**Data Not Lognormal at 5% Significance Level**											
133												
134	**Lognormal Statistics**											
135					Minimum of Logged Data	4.605	Mean of logged Data	4.629				
136					Maximum of Logged Data	6.016	SD of logged Data	0.185				
137												
138	**Assuming Lognormal Distribution**											
139					95% H-UCL	108.7	90% Chebyshev (MVUE) UCL	111.9				
140					95% Chebyshev (MVUE) UCL	115.3	97.5% Chebyshev (MVUE) UCL	120.2				
141					99% Chebyshev (MVUE) UCL	129.6						
142												
143	**Nonparametric Distribution Free UCL Statistics**											
144	**Data do not follow a Discernible Distribution (0.05)**											
145												
146	**Nonparametric Distribution Free UCLs**											
147					95% CLT UCL	114.1	95% Jackknife UCL	N/A				
148					95% Standard Bootstrap UCL	N/A	95% Bootstrap-t UCL	N/A				
149					95% Hall's Bootstrap UCL	N/A	95% Percentile Bootstrap UCL	N/A				
150					95% BCA Bootstrap UCL	N/A						
151					90% Chebyshev(Mean, Sd) UCL	121.4	95% Chebyshev(Mean, Sd) UCL	128.6				
152					97.5% Chebyshev(Mean, Sd) UCL	138.7	99% Chebyshev(Mean, Sd) UCL	158.5				
153												
154	**Suggested UCL to Use**											
155					95% Student's-t UCL	114.3	or 95% Modified-t UCL	115.2				
156												
157	Note: Suggestions regarding the selection of a 95% UCL are provided to help the user to select the most appropriate 95% UCL.											
158	Recommendations are based upon data size, data distribution, and skewness.											
159	These recommendations are based upon the results of the simulation studies summarized in Singh, Maichle, and Lee (2006).											
160	However, simulations results will not cover all Real World data sets; for additional insight the user may want to consult a statistician.											
161												

Appendix H

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

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

CERTIFICATE OF ANALYSIS 290524

Client Details

Client	Douglas Partners Pty Ltd
Attention	Kurt Plambeck
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**84503.02, Emu Plains**
Number of Samples	5 Soil
Date samples received	08/03/2022
Date completed instructions received	08/03/2022

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	15/03/2022
Date of Issue	06/05/2022
Reissue Details	This report replaces R00 due to amendments to sample ID's

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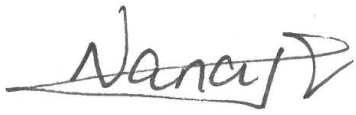
Asbestos Approved By
Analysed by Asbestos Approved Analyst: Panika Wongchanda
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Alexander Mitchell Maclean, Senior Chemist
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Josh Williams, Organics and LC Supervisor
Lucy Zhu, Asbestos Supervisor
Thomas Beenie, Prep Team Leader

Authorised By



Nancy Zhang, Laboratory Manager

PFAS in Soils Short		
Our Reference		290524-1
Your Reference	UNITS	BH104
Depth		0.4-0.5
Date Sampled		01/03/2022
Type of sample		Soil
Date prepared	-	09/03/2022
Date analysed	-	09/03/2022
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	<0.1
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*	%	104
Surrogate $^{13}C_2$ *PFOA*	%	98
Extracted ISTD $^{18}O_2$ *PFHxS*	%	106
Extracted ISTD $^{13}C_4$ *PFOS*	%	103
Extracted ISTD $^{13}C_4$ *PFOA*	%	116
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	97
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	94
Total Positive PFHxS & PFOS	µg/kg	<0.1
Total Positive PFOS & PFOA	µg/kg	<0.1
Total Positive PFAS	µg/kg	<0.1

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		290524-1	290524-2	290524-3	290524-4	290524-5
Your Reference	UNITS	BH104	BH104	BH103	BH103	BD1/322
Depth		0.4-0.5	0.9-1	0-0.1	0.9-1	-
Date Sampled		01/03/2022	01/03/2022	01/03/2022	01/03/2022	01/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Date analysed	-	09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	88	110	110	82	89

svTRH (C10-C40) in Soil						
Our Reference		290524-1	290524-2	290524-3	290524-4	290524-5
Your Reference	UNITS	BH104	BH104	BH103	BH103	BD1/322
Depth		0.4-0.5	0.9-1	0-0.1	0.9-1	-
Date Sampled		01/03/2022	01/03/2022	01/03/2022	01/03/2022	01/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Date analysed	-	10/03/2022	10/03/2022	10/03/2022	10/03/2022	10/03/2022
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	%	75	71	74	70	70

PAHs in Soil						
Our Reference		290524-1	290524-2	290524-3	290524-4	290524-5
Your Reference	UNITS	BH104	BH104	BH103	BH103	BD1/322
Depth		0.4-0.5	0.9-1	0-0.1	0.9-1	-
Date Sampled		01/03/2022	01/03/2022	01/03/2022	01/03/2022	01/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Date analysed	-	09/03/2022	11/03/2022	11/03/2022	09/03/2022	11/03/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	89	97	112	86	98

Organochlorine Pesticides in soil			
Our Reference		290524-1	290524-4
Your Reference	UNITS	BH104	BH103
Depth		0.4-0.5	0.9-1
Date Sampled		01/03/2022	01/03/2022
Type of sample		Soil	Soil
Date extracted	-	09/03/2022	09/03/2022
Date analysed	-	09/03/2022	09/03/2022
alpha-BHC	mg/kg	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1
Surrogate TCMX	%	89	89

Organophosphorus Pesticides in Soil			
Our Reference		290524-1	290524-4
Your Reference	UNITS	BH104	BH103
Depth		0.4-0.5	0.9-1
Date Sampled		01/03/2022	01/03/2022
Type of sample		Soil	Soil
Date extracted	-	09/03/2022	09/03/2022
Date analysed	-	09/03/2022	09/03/2022
Dichlorvos	mg/kg	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	89	89

PCBs in Soil			
Our Reference		290524-1	290524-4
Your Reference	UNITS	BH104	BH103
Depth		0.4-0.5	0.9-1
Date Sampled		01/03/2022	01/03/2022
Type of sample		Soil	Soil
Date extracted	-	09/03/2022	09/03/2022
Date analysed	-	09/03/2022	09/03/2022
Aroclor 1016	mg/kg	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1
Surrogate TCMX	%	89	89

Acid Extractable metals in soil						
Our Reference		290524-1	290524-2	290524-3	290524-4	290524-5
Your Reference	UNITS	BH104	BH104	BH103	BH103	BD1/322
Depth		0.4-0.5	0.9-1	0-0.1	0.9-1	-
Date Sampled		01/03/2022	01/03/2022	01/03/2022	01/03/2022	01/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Date analysed	-	10/03/2022	10/03/2022	10/03/2022	10/03/2022	10/03/2022
Arsenic	mg/kg	<4	<4	6	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	5	69	13	8	21
Copper	mg/kg	5	8	19	7	6
Lead	mg/kg	8	7	19	15	6
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	5	9	5	5
Zinc	mg/kg	10	20	51	23	24

Misc Soil - Inorg			
Our Reference		290524-1	290524-4
Your Reference	UNITS	BH104	BH103
Depth		0.4-0.5	0.9-1
Date Sampled		01/03/2022	01/03/2022
Type of sample		Soil	Soil
Date prepared	-	09/03/2022	09/03/2022
Date analysed	-	09/03/2022	09/03/2022
Total Phenolics (as Phenol)	mg/kg	<5	<5

Moisture						
Our Reference		290524-1	290524-2	290524-3	290524-4	290524-5
Your Reference	UNITS	BH104	BH104	BH103	BH103	BD1/322
Depth		0.4-0.5	0.9-1	0-0.1	0.9-1	-
Date Sampled		01/03/2022	01/03/2022	01/03/2022	01/03/2022	01/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	09/03/2022	09/03/2022	09/03/2022	09/03/2022	09/03/2022
Date analysed	-	10/03/2022	10/03/2022	10/03/2022	10/03/2022	10/03/2022
Moisture	%	7.8	5.9	29	11	6.2

Asbestos ID - soils			
Our Reference		290524-1	290524-4
Your Reference	UNITS	BH104	BH103
Depth		0.4-0.5	0.9-1
Date Sampled		01/03/2022	01/03/2022
Type of sample		Soil	Soil
Date analysed	-	10/03/2022	10/03/2022
Sample mass tested	g	Approx. 30g	Approx. 30g
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-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
Trace Analysis	-	No asbestos detected	No asbestos detected

Misc Inorg - Soil		
Our Reference		290524-1
Your Reference	UNITS	BH104
Depth		0.4-0.5
Date Sampled		01/03/2022
Type of sample		Soil
Date prepared	-	10/03/2022
Date analysed	-	10/03/2022
pH 1:5 soil:water	pH Units	8.7

CEC		
Our Reference		290524-1
Your Reference	UNITS	BH104
Depth		0.4-0.5
Date Sampled		01/03/2022
Type of sample		Soil
Date prepared	-	14/03/2022
Date analysed	-	14/03/2022
Exchangeable Ca	meq/100g	3.4
Exchangeable K	meq/100g	0.1
Exchangeable Mg	meq/100g	0.2
Exchangeable Na	meq/100g	<0.1
Cation Exchange Capacity	meq/100g	3.7

PFAS in TCLP Short		
Our Reference		290524-1
Your Reference	UNITS	BH104
Depth		0.4-0.5
Date Sampled		01/03/2022
Type of sample		Soil
Date prepared	-	10/03/2022
Date analysed	-	10/03/2022
pH of soil for fluid# determ.	pH units	7.8
pH of soil TCLP (after HCl)	pH units	1.6
Extraction fluid used		1
pH of final Leachate	pH units	5.0
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01
6:2 FTS	µg/L	<0.01
8:2 FTS	µg/L	<0.02
Surrogate $^{13}C_8$ *PFOS*	%	96
Surrogate $^{13}C_2$ *PFOA*	%	88
Extracted ISTD $^{18}O_2$ *PFHxS*	%	92
Extracted ISTD $^{13}C_4$ *PFOS*	%	102
Extracted ISTD $^{13}C_4$ *PFOA*	%	112
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	109
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	133
Total Positive PFHxS & PFOS	µg/L	<0.01
Total Positive PFOS & PFOA	µg/L	<0.01
Total Positive PFAS	µg/L	<0.01

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
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.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.

Method ID	Methodology Summary
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

Method ID	Methodology Summary
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 5.3 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: PFAS in Soils Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Date prepared	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
Date analysed	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
6:2 FTS	µg/kg	0.1	Org-029	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
8:2 FTS	µg/kg	0.2	Org-029	<0.2	[NT]	[NT]	[NT]	[NT]	90	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	111	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	99	[NT]	[NT]	[NT]	[NT]	104	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	109	[NT]	[NT]	[NT]	[NT]	109	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	114	[NT]	[NT]	[NT]	[NT]	106	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	129	[NT]	[NT]	[NT]	[NT]	120	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	98	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Date extracted	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
Date analysed	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	82	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	[NT]	[NT]	[NT]	[NT]	82	[NT]
Benzene	mg/kg	0.2	Org-023	<0.2	[NT]	[NT]	[NT]	[NT]	84	[NT]
Toluene	mg/kg	0.5	Org-023	<0.5	[NT]	[NT]	[NT]	[NT]	84	[NT]
Ethylbenzene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	77	[NT]
m+p-xylene	mg/kg	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	82	[NT]
o-Xylene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Naphthalene	mg/kg	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	104	[NT]	[NT]	[NT]	[NT]	89	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Date extracted	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
Date analysed	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	71	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	70	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	71	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	70	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	86	[NT]
Surrogate o-Terphenyl	%		Org-020	70	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	[NT]
Date extracted	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
Date analysed	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	93	[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]	85	[NT]
Fluorene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	106	[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]	90	[NT]
Pyrene	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	101	[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]	75	[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]	118	[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	126	[NT]	[NT]	[NT]	[NT]	118	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	[NT]
Date extracted	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
Date analysed	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	78	[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]	78	[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]	75	[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]	85	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	82	[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]	80	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Endrin	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	70	[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]	70	[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]	66	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	96	[NT]	[NT]	[NT]	[NT]	84	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	[NT]
Date extracted	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
Date analysed	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	111	[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]
Chlorpyriphos-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]	73	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	65	[NT]
Malathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	83	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	84	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	62	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	67	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	96	[NT]	[NT]	[NT]	[NT]	84	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-11	[NT]
Date extracted	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
Date analysed	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	85	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	96	[NT]	[NT]	[NT]	[NT]	84	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Date prepared	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
Date analysed	-			10/03/2022	[NT]	[NT]	[NT]	[NT]	10/03/2022	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	97	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	96	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]

QUALITY CONTROL: Misc Soil - Inorg					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-12	[NT]
Date prepared	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
Date analysed	-			09/03/2022	[NT]	[NT]	[NT]	[NT]	09/03/2022	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	[NT]	[NT]	[NT]	[NT]	110	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			10/03/2022	[NT]	[NT]	[NT]	[NT]	10/03/2022	[NT]
Date analysed	-			10/03/2022	[NT]	[NT]	[NT]	[NT]	10/03/2022	[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-1	[NT]
Date prepared	-			14/03/2022	[NT]	[NT]	[NT]	[NT]	14/03/2022	[NT]
Date analysed	-			14/03/2022	[NT]	[NT]	[NT]	[NT]	14/03/2022	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	120	[NT]

QUALITY CONTROL: PFAS in TCLP Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			10/03/2022	[NT]	[NT]	[NT]	[NT]	10/03/2022	[NT]
Date analysed	-			10/03/2022	[NT]	[NT]	[NT]	[NT]	10/03/2022	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	94	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	109	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	103	[NT]
6:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	118	[NT]
8:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	115	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	95	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	93	[NT]	[NT]	[NT]	[NT]	91	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	95	[NT]	[NT]	[NT]	[NT]	101	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	93	[NT]	[NT]	[NT]	[NT]	97	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	101	[NT]	[NT]	[NT]	[NT]	93	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	93	[NT]	[NT]	[NT]	[NT]	89	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	113	[NT]	[NT]	[NT]	[NT]	104	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

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

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	84503.02	**Suburb:**	Emu Plains	**To:**	*Envirolab Services*
Project Manager:	Kurt Plambeck	**Order Number:**		**Sampler:**	RM		*12 Ashley St, Chatswood NSW 2067*
Email:	Kurt.Plambeck@douglaspartners.com.au					**Attn:**	*Sample Receipt*
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day					**Contact:**	*(02) 9910 6200 samplereceipt@envirolab.com.au*
Prior Storage:	☐ Fridge ☐ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?**	☐ No ☐ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)				

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Combo 8a	Combo 3	PFAS short suite (total and TCLP)	pH /CEC	combo 3							Notes/ Preservation/ Additional Requirements
1	BH001	0.4	0.5	1/03/22			X		X	X								
2	BH001	0.9	1	1/03/22				X										
3	BH002	0	0.1	1/03/22				X										
4	BH002	0.9	1	1/03/22			X											
5	BD1/322			1/03/22							X							

Envirolab Services
12 Ashley St
...ood NSW 2067
Ph: (02) 9910 6200
Job id: 290524
Date received: 8/3/22
Time received: 1740
Received By: AB
Temp: Cool/Ambient
Cooling: Ice/Icepack 7°
Security: Intact/Broken/None

Metals to analyse:		**LAB RECEIPT**	
Number of samples in container:	**Transported to laboratory by:**	**Lab Ref. No:**	
Send results to:	Douglas Partners Pty Ltd	**Received by:**	AB
Address:	96 Hermitage Road, West Ryde NSW 2114	**Phone:** (02) 9809 0666	**Date & Time:**	8/3/22 1740
Relinquished by:	**Date:**	**Signed:**	**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

CERTIFICATE OF ANALYSIS 290882

Client Details

Client	Douglas Partners Pty Ltd
Attention	Kurt Plambeck
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**84503.02, Emu Plains**
Number of Samples	25 Soil
Date samples received	14/03/2022
Date completed instructions received	14/03/2022

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	21/03/2022
Date of Issue	06/05/2022
Reissue Details	This report replaces R00 due to amendments to sample ID's.

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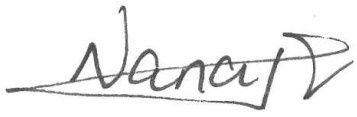
Asbestos Approved By
Analysed by Asbestos Approved Analyst: Lucy Zhu
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Alexander Mitchell Maclean, Senior Chemist
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Kyle Gavrily, Chemist
Lucy Zhu, Asbestos Supervisor
Nick Sarlamis, Assistant Operation Manager
Thomas Beenie, Prep Team Leader

Authorised By



Nancy Zhang, Laboratory Manager

PFAS in Soils Short				
Our Reference		290882-10	290882-18	290882-22
Your Reference	UNITS	BH108	BH113	BH116
Depth		0-0.2	0-0.2	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	16/03/2022	16/03/2022	16/03/2022
Perfluorohexanesulfonic acid - PFHxS	µg/kg	<0.1	<0.1	<0.1
Perfluorooctanesulfonic acid PFOS	µg/kg	0.4	1.8	0.2
Perfluorooctanoic acid PFOA	µg/kg	<0.1	0.2	<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*	%	94	94	88
Surrogate $^{13}C_2$ *PFOA*	%	99	102	108
Extracted ISTD $^{18}O_2$ *PFHxS*	%	93	87	94
Extracted ISTD $^{13}C_4$ *PFOS*	%	97	80	108
Extracted ISTD $^{13}C_4$ *PFOA*	%	98	84	97
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	114	136	107
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	136	105	132
Total Positive PFHxS & PFOS	µg/kg	0.4	1.8	0.2
Total Positive PFOS & PFOA	µg/kg	0.4	2.0	0.2
Total Positive PFAS	µg/kg	0.4	2.0	0.2

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		290882-1	290882-2	290882-3	290882-4	290882-5
Your Reference	UNITS	BH100	BH100	BH101	BH102	BH102
Depth		0-0.1	0.5-0.6	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		07/03/2022	07/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	80	85	80	81	91

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		290882-6	290882-7	290882-8	290882-9	290882-10
Your Reference	UNITS	BH105	BH105	BH107	BH107	BH108
Depth		0.4-0.5	0.9-1	0-0.2	0.6	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	81	88	89	80	87

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		290882-11	290882-12	290882-13	290882-14	290882-15
Your Reference	UNITS	BH109	BH110	BH110	BH111	BH111
Depth		0.4-0.5	0-0.2	0.4-0.5	0-0.2	0.8-1.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	84	94	91	78	91

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		290882-16	290882-17	290882-18	290882-19	290882-20
Your Reference	UNITS	BH112	BH112	BH113	BH114	BH115
Depth		0-0.2	0.4-0.6	0-0.2	0-0.2	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	93	94	87	85	87

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		290882-21	290882-22	290882-23	290882-24	290882-25
Your Reference	UNITS	BH115	BH116	BD05	Spike	Blank
Depth		0.4-0.5	0-0.2	-	-	-
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	21/03/2022	21/03/2022	21/03/2022	21/03/2022	21/03/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	[NA]	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	[NA]	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	[NA]	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	75%	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	76%	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	76%	<1
m+p-xylene	mg/kg	<2	<2	<2	75%	<2
o-Xylene	mg/kg	<1	<1	<1	77%	<1
Naphthalene	mg/kg	<1	<1	<1	[NA]	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	[NA]	<1
Surrogate aaa-Trifluorotoluene	%	81	86	91	87	94

svTRH (C10-C40) in Soil						
Our Reference		290882-1	290882-2	290882-3	290882-4	290882-5
Your Reference	UNITS	BH100	BH100	BH101	BH102	BH102
Depth		0-0.1	0.5-0.6	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		07/03/2022	07/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
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	%	90	89	90	88	92

svTRH (C10-C40) in Soil						
Our Reference		290882-6	290882-7	290882-8	290882-9	290882-10
Your Reference	UNITS	BH105	BH105	BH107	BH107	BH108
Depth		0.4-0.5	0.9-1	0-0.2	0.6	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
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	%	91	91	91	87	88

svTRH (C10-C40) in Soil						
Our Reference		290882-11	290882-12	290882-13	290882-14	290882-15
Your Reference	UNITS	BH109	BH110	BH110	BH111	BH111
Depth		0.4-0.5	0-0.2	0.4-0.5	0-0.2	0.8-1.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
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	%	87	90	87	89	88

svTRH (C10-C40) in Soil						
Our Reference		290882-16	290882-17	290882-18	290882-19	290882-20
Your Reference	UNITS	BH112	BH112	BH113	BH114	BH115
Depth		0-0.2	0.4-0.6	0-0.2	0-0.2	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	280	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	270	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	550	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	120	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	120	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	410	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	530	<50	<50
Surrogate o-Terphenyl	%	89	87	104	88	83

svTRH (C10-C40) in Soil				
Our Reference		290882-21	290882-22	290882-23
Your Reference	UNITS	BH115	BH116	BD05
Depth		0.4-0.5	0-0.2	-
Date Sampled		18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50
Surrogate o-Terphenyl	%	81	80	82

PAHs in Soil						
Our Reference		290882-1	290882-2	290882-3	290882-4	290882-5
Your Reference	UNITS	BH100	BH100	BH101	BH102	BH102
Depth		0-0.1	0.5-0.6	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		07/03/2022	07/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	80	81	98	92	105

PAHs in Soil						
Our Reference		290882-6	290882-7	290882-8	290882-9	290882-10
Your Reference	UNITS	BH105	BH105	BH107	BH107	BH108
Depth		0.4-0.5	0.9-1	0-0.2	0.6	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	100	89	94	87	93

PAHs in Soil						
Our Reference		290882-11	290882-12	290882-13	290882-14	290882-15
Your Reference	UNITS	BH109	BH110	BH110	BH111	BH111
Depth		0.4-0.5	0-0.2	0.4-0.5	0-0.2	0.8-1.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	0.1	<0.05	<0.05	<0.05	0.3
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	%	110	107	86	88	95

PAHs in Soil						
Our Reference		290882-16	290882-17	290882-18	290882-19	290882-20
Your Reference	UNITS	BH112	BH112	BH113	BH114	BH115
Depth		0-0.2	0.4-0.6	0-0.2	0-0.2	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	97	82	116	92	92

PAHs in Soil				
Our Reference		290882-21	290882-22	290882-23
Your Reference	UNITS	BH115	BH116	BD05
Depth		0.4-0.5	0-0.2	-
Date Sampled		18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.1
Pyrene	mg/kg	<0.1	<0.1	0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	0.3
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	105	87	84

Organochlorine Pesticides in soil						
Our Reference		290882-1	290882-3	290882-5	290882-6	290882-9
Your Reference	UNITS	BH100	BH101	BH102	BH105	BH107
Depth		0-0.1	0.1-0.2	0.4-0.5	0.4-0.5	0.6
Date Sampled		07/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	81	98	98	104	88

Organochlorine Pesticides in soil						
Our Reference		290882-10	290882-11	290882-12	290882-14	290882-17
Your Reference	UNITS	BH108	BH109	BH110	BH111	BH112
Depth		0-0.2	0.4-0.5	0-0.2	0-0.2	0.4-0.6
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
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	0.9	<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	1.2	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	108	105	92	88

Organochlorine Pesticides in soil				
Our Reference		290882-18	290882-19	290882-22
Your Reference	UNITS	BH113	BH114	BH116
Depth		0-0.2	0-0.2	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	114	102	91

Organophosphorus Pesticides in Soil						
Our Reference		290882-1	290882-3	290882-5	290882-6	290882-9
Your Reference	UNITS	BH100	BH101	BH102	BH105	BH107
Depth		0-0.1	0.1-0.2	0.4-0.5	0.4-0.5	0.6
Date Sampled		07/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	81	98	98	104	88

Organophosphorus Pesticides in Soil						
Our Reference		290882-10	290882-11	290882-12	290882-14	290882-17
Your Reference	UNITS	BH108	BH109	BH110	BH111	BH112
Depth		0-0.2	0.4-0.5	0-0.2	0-0.2	0.4-0.6
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	108	105	92	88

Organophosphorus Pesticides in Soil				
Our Reference		290882-18	290882-19	290882-22
Your Reference	UNITS	BH113	BH114	BH116
Depth		0-0.2	0-0.2	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	114	102	91

PCBs in Soil						
Our Reference		290882-1	290882-3	290882-5	290882-6	290882-9
Your Reference	UNITS	BH100	BH101	BH102	BH105	BH107
Depth		0-0.1	0.1-0.2	0.4-0.5	0.4-0.5	0.6
Date Sampled		07/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	81	98	98	104	88

PCBs in Soil						
Our Reference		290882-10	290882-11	290882-12	290882-14	290882-17
Your Reference	UNITS	BH108	BH109	BH110	BH111	BH112
Depth		0-0.2	0.4-0.5	0-0.2	0-0.2	0.4-0.6
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	97	108	105	92	88

PCBs in Soil				
Our Reference		290882-18	290882-19	290882-22
Your Reference	UNITS	BH113	BH114	BH116
Depth		0-0.2	0-0.2	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil
Date extracted	-	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	18/03/2022	18/03/2022	18/03/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1
Surrogate TCMX	%	114	102	91

Misc Soil - Inorg						
Our Reference		290882-1	290882-3	290882-5	290882-6	290882-9
Your Reference	UNITS	BH100	BH101	BH102	BH105	BH107
Depth		0-0.1	0.1-0.2	0.4-0.5	0.4-0.5	0.6
Date Sampled		07/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference		290882-10	290882-11	290882-12	290882-14	290882-17
Your Reference	UNITS	BH108	BH109	BH110	BH111	BH112
Depth		0-0.2	0.4-0.5	0-0.2	0-0.2	0.4-0.6
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg				
Our Reference		290882-18	290882-19	290882-22
Your Reference	UNITS	BH113	BH114	BH116
Depth		0-0.2	0-0.2	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	17/03/2022	17/03/2022	17/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5

Acid Extractable metals in soil						
Our Reference		290882-1	290882-2	290882-3	290882-4	290882-5
Your Reference	UNITS	BH100	BH100	BH101	BH102	BH102
Depth		0-0.1	0.5-0.6	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		07/03/2022	07/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	5	7	11	10	10
Copper	mg/kg	4	3	10	43	13
Lead	mg/kg	14	12	25	22	20
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	2	7	11	6
Zinc	mg/kg	17	10	31	61	27

Acid Extractable metals in soil						
Our Reference		290882-6	290882-7	290882-8	290882-9	290882-10
Your Reference	UNITS	BH105	BH105	BH107	BH107	BH108
Depth		0.4-0.5	0.9-1	0-0.2	0.6	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
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	2	8	7	7
Copper	mg/kg	5	2	6	2	7
Lead	mg/kg	7	4	18	10	18
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	1	3	2	3
Zinc	mg/kg	18	6	26	9	33

Acid Extractable metals in soil						
Our Reference		290882-11	290882-12	290882-13	290882-14	290882-15
Your Reference	UNITS	BH109	BH110	BH110	BH111	BH111
Depth		0.4-0.5	0-0.2	0.4-0.5	0-0.2	0.8-1.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Arsenic	mg/kg	<4	<4	4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	37	9	10	6	8
Copper	mg/kg	20	11	6	7	4
Lead	mg/kg	9	15	10	20	21
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	40	6	4	3	3
Zinc	mg/kg	37	34	18	24	19

Acid Extractable metals in soil						
Our Reference		290882-16	290882-17	290882-18	290882-19	290882-20
Your Reference	UNITS	BH112	BH112	BH113	BH114	BH115
Depth		0-0.2	0.4-0.6	0-0.2	0-0.2	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	6	7	8	3	9
Copper	mg/kg	8	12	100	6	7
Lead	mg/kg	12	9	13	8	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	5	8	4	2	5
Zinc	mg/kg	21	21	110	21	20

Acid Extractable metals in soil					
Our Reference		290882-21	290882-22	290882-23	290882-26
Your Reference	UNITS	BH115	BH116	BD05	BH003 - [TRIPLICATE]
Depth		0.4-0.5	0-0.2	-	0-0.1
Date Sampled		18/03/2022	18/03/2022	18/03/2022	07/03/2022
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Arsenic	mg/kg	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	13	6	8	6
Copper	mg/kg	6	8	6	3
Lead	mg/kg	9	10	27	13
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	7	4	3	2
Zinc	mg/kg	15	28	26	11

Moisture						
Our Reference		290882-1	290882-2	290882-3	290882-4	290882-5
Your Reference	UNITS	BH100	BH100	BH101	BH102	BH102
Depth		0-0.1	0.5-0.6	0.1-0.2	0.1-0.2	0.4-0.5
Date Sampled		07/03/2022	07/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Moisture	%	15	15	21	14	9.5

Moisture						
Our Reference		290882-6	290882-7	290882-8	290882-9	290882-10
Your Reference	UNITS	BH105	BH105	BH107	BH107	BH108
Depth		0.4-0.5	0.9-1	0-0.2	0.6	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Moisture	%	9.1	5.7	23	16	19

Moisture						
Our Reference		290882-11	290882-12	290882-13	290882-14	290882-15
Your Reference	UNITS	BH109	BH110	BH110	BH111	BH111
Depth		0.4-0.5	0-0.2	0.4-0.5	0-0.2	0.8-1.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Moisture	%	14	19	6.3	17	2.1

Moisture						
Our Reference		290882-16	290882-17	290882-18	290882-19	290882-20
Your Reference	UNITS	BH112	BH112	BH113	BH114	BH115
Depth		0-0.2	0.4-0.6	0-0.2	0-0.2	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Moisture	%	9.9	8.1	27	11	15

Moisture				
Our Reference		290882-21	290882-22	290882-23
Your Reference	UNITS	BH115	BH116	BD05
Depth		0.4-0.5	0-0.2	-
Date Sampled		18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	16/03/2022	16/03/2022	16/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022
Moisture	%	15	9.2	13

Asbestos ID - soils						
Our Reference		290882-1	290882-3	290882-4	290882-5	290882-6
Your Reference	UNITS	BH100	BH101	BH102	BH102	BH105
Depth		0-0.1	0.1-0.2	0.1-0.2	0.4-0.5	0.4-0.5
Date Sampled		07/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Sample mass tested	g	Approx. 35g	Approx. 30g	Approx. 35g	Approx. 35g	Approx. 30g
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		290882-7	290882-8	290882-9	290882-10	290882-11
Your Reference	UNITS	BH105	BH107	BH107	BH108	BH109
Depth		0.9-1	0-0.2	0.6	0-0.2	0.4-0.5
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Sample mass tested	g	Approx. 30g	Approx. 55g	Approx. 55g	Approx. 55g	Approx. 50g
Sample Description	-	Brown fine-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		290882-12	290882-14	290882-15	290882-16	290882-17
Your Reference	UNITS	BH110	BH111	BH111	BH112	BH112
Depth		0-0.2	0-0.2	0.8-1.2	0-0.2	0.4-0.6
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Sample mass tested	g	Approx. 30g	Approx. 55g	Approx. 50g	Approx. 40g	Approx. 55g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils					
Our Reference		290882-18	290882-19	290882-20	290882-22
Your Reference	UNITS	BH113	BH114	BH115	BH116
Depth		0-0.2	0-0.2	0-0.2	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	17/03/2022	17/03/2022	17/03/2022	17/03/2022
Sample mass tested	g	Approx. 20g	Approx. 30g	Approx. 30g	Approx. 35g
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Misc Inorg - Soil				
Our Reference		290882-4	290882-10	290882-19
Your Reference	UNITS	BH102	BH108	BH114
Depth		0.1-0.2	0-0.2	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	17/03/2022	17/03/2022	17/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022
pH 1:5 soil:water	pH Units	8.9	7.8	7.2

CEC				
Our Reference		290882-4	290882-10	290882-19
Your Reference	UNITS	BH102	BH108	BH114
Depth		0.1-0.2	0-0.2	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	21/03/2022	21/03/2022	21/03/2022
Date analysed	-	21/03/2022	21/03/2022	21/03/2022
Exchangeable Ca	meq/100g	32	19	2.4
Exchangeable K	meq/100g	0.8	0.2	<0.1
Exchangeable Mg	meq/100g	0.5	0.3	0.5
Exchangeable Na	meq/100g	0.2	<0.1	<0.1
Cation Exchange Capacity	meq/100g	34	19	3.0

PFAS in TCLP Short				
Our Reference		290882-10	290882-18	290882-22
Your Reference	UNITS	BH108	BH113	BH116
Depth		0-0.2	0-0.2	0-0.2
Date Sampled		18/03/2022	18/03/2022	18/03/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	17/03/2022	17/03/2022	17/03/2022
Date analysed	-	17/03/2022	17/03/2022	17/03/2022
pH of soil for fluid# determ.	pH units	9.0	8.8	9.1
pH of soil TCLP (after HCl)	pH units	1.6	1.6	1.6
Extraction fluid used		1	1	1
pH of final Leachate	pH units	5.0	4.9	5.0
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	0.01	0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	<0.01	<0.01
6:2 FTS	µg/L	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02
Surrogate $^{13}C_8$ *PFOS*	%	101	94	96
Surrogate $^{13}C_2$ *PFOA*	%	92	93	91
Extracted ISTD $^{18}O_2$ *PFHxS*	%	102	107	110
Extracted ISTD $^{13}C_4$ *PFOS*	%	99	105	103
Extracted ISTD $^{13}C_4$ *PFOA*	%	110	108	110
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	85	93	89
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	102	101	100
Total Positive PFHxS & PFOS	µg/L	<0.01	0.01	0.01
Total Positive PFOS & PFOA	µg/L	<0.01	0.01	0.01
Total Positive PFAS	µg/L	<0.01	0.01	0.01

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-004	Toxicity Characteristic Leaching Procedure (TCLP) using AS 4439 and USEPA 1311. Please note that the mass used may be scaled down from default based on sample mass available. Samples are stored at 2-6oC before and after leachate preparation.
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.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.

Method ID	Methodology Summary
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

Method ID	Methodology Summary
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 5.3 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: PFAS in Soils Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	290882-22
Date prepared	-			16/03/2022	10	16/03/2022	16/03/2022		16/03/2022	16/03/2022
Date analysed	-			16/03/2022	10	16/03/2022	16/03/2022		16/03/2022	16/03/2022
Perfluorohexanesulfonic acid - PFHxS	µg/kg	0.1	Org-029	<0.1	10	<0.1	<0.1	0	105	105
Perfluorooctanesulfonic acid PFOS	µg/kg	0.1	Org-029	<0.1	10	0.4	0.3	29	93	91
Perfluorooctanoic acid PFOA	µg/kg	0.1	Org-029	<0.1	10	<0.1	<0.1	0	103	105
6:2 FTS	µg/kg	0.1	Org-029	<0.1	10	<0.1	<0.1	0	115	119
8:2 FTS	µg/kg	0.2	Org-029	<0.2	10	<0.2	<0.2	0	102	100
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	100	10	94	94	0	90	90
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	106	10	99	106	7	100	106
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	98	10	93	93	0	97	93
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	101	10	97	101	4	108	104
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	100	10	98	96	2	100	97
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	111	10	114	117	3	108	110
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	118	10	136	141	4	110	125

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	290882-3
Date extracted	-			16/03/2022	1	16/03/2022	16/03/2022		16/03/2022	16/03/2022
Date analysed	-			21/03/2022	1	21/03/2022	21/03/2022		21/03/2022	21/03/2022
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	82	86
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	82	86
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	71	74
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	78	77
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	83	87
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	90	95
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	85	91
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	94	1	80	85	6	86	80

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	290882-22
Date extracted	-			[NT]	10	16/03/2022	16/03/2022		16/03/2022	16/03/2022
Date analysed	-			[NT]	10	21/03/2022	21/03/2022		21/03/2022	21/03/2022
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	10	<25	<25	0	84	89
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	10	<25	<25	0	84	89
Benzene	mg/kg	0.2	Org-023	[NT]	10	<0.2	<0.2	0	75	81
Toluene	mg/kg	0.5	Org-023	[NT]	10	<0.5	<0.5	0	80	89
Ethylbenzene	mg/kg	1	Org-023	[NT]	10	<1	<1	0	83	88
m+p-xylene	mg/kg	2	Org-023	[NT]	10	<2	<2	0	90	93
o-Xylene	mg/kg	1	Org-023	[NT]	10	<1	<1	0	86	92
Naphthalene	mg/kg	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	10	87	84	4	89	87

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]	21	16/03/2022	16/03/2022		[NT]	[NT]
Date analysed	-			[NT]	21	21/03/2022	21/03/2022		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	21	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	21	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	21	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	21	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	21	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	21	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	21	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	21	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	21	81	88	8	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	290882-3
Date extracted	-			16/03/2022	1	16/03/2022	16/03/2022		16/03/2022	16/03/2022
Date analysed	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	18/03/2022
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	99	99
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	104	109
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	114	121
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	99	99
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	104	109
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	114	121
Surrogate o-Terphenyl	%		Org-020	88	1	90	90	0	91	114

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	290882-22
Date extracted	-			[NT]	10	16/03/2022	16/03/2022		18/03/2022	16/03/2022
Date analysed	-			[NT]	10	18/03/2022	18/03/2022		18/03/2022	18/03/2022
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	10	<50	<50	0	97	94
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	10	<100	<100	0	100	102
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	10	<100	<100	0	138	116
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	10	<50	<50	0	97	94
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	10	<100	<100	0	100	102
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	10	<100	<100	0	138	116
Surrogate o-Terphenyl	%		Org-020	[NT]	10	88	87	1	107	80

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	16/03/2022	16/03/2022		[NT]	[NT]
Date analysed	-			[NT]	21	18/03/2022	18/03/2022		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	21	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	21	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	21	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	21	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	21	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	21	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	21	81	80	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	290882-3
Date extracted	-			16/03/2022	1	16/03/2022	16/03/2022		16/03/2022	16/03/2022
Date analysed	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	18/03/2022
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	116
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	85	111
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	105
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	105
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	102
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	81	105
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	87	105
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	78	102
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	93	1	80	100	22	83	108

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	290882-22
Date extracted	-			[NT]	10	16/03/2022	16/03/2022		16/03/2022	16/03/2022
Date analysed	-			[NT]	10	18/03/2022	18/03/2022		18/03/2022	18/03/2022
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	93	99
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	103	101
Fluorene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	101	99
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	100	94
Anthracene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	102	92
Pyrene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	103	97
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	99	91
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	10	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	10	<0.05	<0.05	0	98	86
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	10	93	82	13	110	101

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	21	16/03/2022	16/03/2022		[NT]	[NT]
Date analysed	-			[NT]	21	18/03/2022	18/03/2022		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	21	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	21	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	21	105	97	8	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	290882-3
Date extracted	-			16/03/2022	1	16/03/2022	16/03/2022		16/03/2022	16/03/2022
Date analysed	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	18/03/2022
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	74	100
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	75	99
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	75	93
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	89	103
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	100
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	80	103
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	108
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	129
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	78	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	74	120
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	100	1	81	100	21	80	102

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	290882-22
Date extracted	-			[NT]	10	16/03/2022	16/03/2022		16/03/2022	16/03/2022
Date analysed	-			[NT]	10	18/03/2022	18/03/2022		18/03/2022	18/03/2022
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	88	88
HCB	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	96	85
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	85	85
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	105	104
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	108	96
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	105	94
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	108	102
Endrin	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	109	94
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	102	94
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	94	82
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	10	97	91	6	97	98

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	290882-3
Date extracted	-			16/03/2022	1	16/03/2022	16/03/2022		16/03/2022	16/03/2022
Date analysed	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	18/03/2022
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	103	117
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	91
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	69	93
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	136
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	108
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	66	82
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	76	119
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	100	1	81	100	21	80	102

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	290882-22
Date extracted	-			[NT]	10	16/03/2022	16/03/2022		16/03/2022	16/03/2022
Date analysed	-			[NT]	10	18/03/2022	18/03/2022		18/03/2022	18/03/2022
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	97	97
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	85	87
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	77	73
Malathion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	95	122
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	98	100
Parathion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	74	66
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	88	94
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	10	97	91	6	97	98

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	290882-3
Date extracted	-			16/03/2022	1	16/03/2022	16/03/2022		16/03/2022	16/03/2022
Date analysed	-			18/03/2022	1	18/03/2022	18/03/2022		18/03/2022	18/03/2022
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	87	100
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	100	1	81	100	21	80	102

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	290882-22
Date extracted	-			[NT]	10	16/03/2022	16/03/2022		16/03/2022	16/03/2022
Date analysed	-			[NT]	10	18/03/2022	18/03/2022		18/03/2022	18/03/2022
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	99	100
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	10	97	91	6	97	98

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	290882-3
Date prepared	-			17/03/2022	1	17/03/2022	17/03/2022		17/03/2022	17/03/2022
Date analysed	-			17/03/2022	1	17/03/2022	17/03/2022		17/03/2022	17/03/2022
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	100	105

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	10	17/03/2022	17/03/2022		[NT]	[NT]
Date analysed	-			[NT]	10	17/03/2022	17/03/2022		[NT]	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	[NT]	10	<5	<5	0	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	290882-3
Date prepared	-			17/03/2022	1	17/03/2022	17/03/2022		17/03/2022	17/03/2022
Date analysed	-			17/03/2022	1	17/03/2022	17/03/2022		17/03/2022	17/03/2022
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	90	84
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	88	74
Chromium	mg/kg	1	Metals-020	<1	1	5	10	67	90	81
Copper	mg/kg	1	Metals-020	<1	1	4	3	29	90	90
Lead	mg/kg	1	Metals-020	<1	1	14	13	7	89	81
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	111	88
Nickel	mg/kg	1	Metals-020	<1	1	2	2	0	91	77
Zinc	mg/kg	1	Metals-020	<1	1	17	11	43	92	87

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-8	290882-22
Date prepared	-			[NT]	10	17/03/2022	17/03/2022		17/03/2022	17/03/2022
Date analysed	-			[NT]	10	17/03/2022	17/03/2022		17/03/2022	17/03/2022
Arsenic	mg/kg	4	Metals-020	[NT]	10	<4	<4	0	97	87
Cadmium	mg/kg	0.4	Metals-020	[NT]	10	<0.4	<0.4	0	95	80
Chromium	mg/kg	1	Metals-020	[NT]	10	7	6	15	98	82
Copper	mg/kg	1	Metals-020	[NT]	10	7	9	25	97	88
Lead	mg/kg	1	Metals-020	[NT]	10	18	17	6	96	80
Mercury	mg/kg	0.1	Metals-021	[NT]	10	<0.1	<0.1	0	90	90
Nickel	mg/kg	1	Metals-020	[NT]	10	3	3	0	98	82
Zinc	mg/kg	1	Metals-020	[NT]	10	33	34	3	99	80

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	21	17/03/2022	17/03/2022		[NT]	[NT]
Date analysed	-			[NT]	21	17/03/2022	17/03/2022		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	21	<4	<4	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	21	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	21	13	13	0	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	21	6	5	18	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	21	9	9	0	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	21	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	21	7	7	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	21	15	14	7	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			17/03/2022	[NT]	[NT]	[NT]	[NT]	17/03/2022	[NT]
Date analysed	-			17/03/2022	[NT]	[NT]	[NT]	[NT]	17/03/2022	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			21/03/2022	[NT]	[NT]	[NT]	[NT]	21/03/2022	[NT]
Date analysed	-			21/03/2022	[NT]	[NT]	[NT]	[NT]	21/03/2022	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: PFAS in TCLP Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	290882-22
Date prepared	-			17/03/2022	10	17/03/2022	17/03/2022		17/03/2022	17/03/2022
Date analysed	-			17/03/2022	10	17/03/2022	17/03/2022		17/03/2022	17/03/2022
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	10	<0.01	<0.01	0	107	110
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	10	<0.01	<0.01	0	107	107
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	10	<0.01	<0.01	0	105	106
6:2 FTS	µg/L	0.01	Org-029	<0.01	10	<0.01	<0.01	0	110	122
8:2 FTS	µg/L	0.02	Org-029	<0.02	10	<0.02	<0.02	0	101	119
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	96	10	101	99	2	100	99
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	94	10	92	97	5	91	89
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	100	10	102	107	5	104	106
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	102	10	99	103	4	97	99
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	100	10	110	107	3	99	101
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	83	10	85	87	2	83	77
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	105	10	102	104	2	104	93

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 290882-1, 3, 4, 5, 6, 7, 17 were sub-sampled from jars provided by the client.

Asbestos: Excessive sample volume was provided for asbestos analysis. A portion of the supplied sample was sub-sampled according to Envirolab procedures. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g (50mL) of sample in its own container as per AS4964-2004.
Note: Samples 290882-8, 9, 10, 11, 12, 14, 15, 16, 18, 19, 20, 22 were sub-sampled from bags provided by the client.

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 290882-1 for Cr and Zn. Therefore a triplicate result has been issued as laboratory sample number 290882-26.

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	84503.02	**Suburb:**	Emu Plains	**To:**	*Envirolab Services*
Project Manager:	Kurt Plambeck	**Order Number:**		**Sampler:** RM	*12 Ashley St, Chatswood NSW 2067*
Email:	Kurt.Plambeck@douglaspartners.com.au			**Attn:**	*Sample Receipt*
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day			**Contact:**	*(02) 9910 6200 samplereceipt@envirolab.com.au*
Prior Storage:	☐ Fridge ☐ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?**	☐ No ☐ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Combo 8a	Combo 3	PFAS short suite (total and TCLP)	pH /CEC	combo 3A	BTEX						Notes/ Preservation/ Additional Requirements
1	BH003	0	0.1	7/03/22			X											
2	BH003	0.5	0.6	7/03/22				X										
3	BH101	0.1	0.2	18/03/22			X											
4	BH102	0.1	0.2	18/03/22						X	X							
5	BH102	0.4	0.5	18/03/22			X											
6	BH105	0.4	0.5	18/03/22			X											
7	BH105	0.9	1	18/03/22							X							
8	BH107	0	0.2	18/03/22							X							
9	BH107	0.6		18/03/22			X											
10	BH108	0	0.2	18/03/22			X		X	X								
11	BH109	0.4	0.5	18/03/22			X											
12	BH110	0	0.2	18/03/22			X											
13	BH110	0.4	0.5	18/03/22				X										
14	BH111	0	0.2	18/03/22			X											

Metals to analyse:		**LAB RECEIPT**	240887
Number of samples in container:	**Transported to laboratory by:**	**Lab Ref. No:**	Env Sydney
Send results to:	Douglas Partners Pty Ltd	**Received by:**	C Mulenga
Address:	96 Hermitage Road, West Ryde NSW 2114 **Phone:** (02) 9809 0666	**Date & Time:**	14/3/22 1410
Relinquished by:	KP 14/3 12:30 **Date:** **Signed:**	**Signed:**	

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	84503.02	**Suburb:**	Emu Plains	**To:**	*Envirolab Services*
Project Manager:	Kurt Plambeck	**Order Number:**		**Dispatch date:**	*12 Ashley St, Chatswood NSW 2067*

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	G - glass P - plastic	Combo 8a	Combo 3	PFAS short suite (total and TCLP)	pH /CEC	combo 3A	BTEX						
15	BH111	0.8	1.2	18/03/22							X							
16	BH112	0	0.2	18/03/22							X							
17	BH112	0.4	0.6	18/03/22			X											
18	BH113	0	0.2	18/03/22			X		X									
19	BH114	0	0.2	18/03/22			X			X								
20	BH115	0	0.2	18/03/22							X							
21	BH115	0.4	0.5	18/03/22				X										
22	BH116	0	0.2	18/03/22			X		X									
23	BD05			18/03/22				X										
24	spike			18/03/22								X						
25	blank			18/03/22								X						
																		290882

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	Kurt Plambeck

Sample Login Details

Your reference	84503.02, Emu Plains
Envirolab Reference	290882
Date Sample Received	14/03/2022
Date Instructions Received	14/03/2022
Date Results Expected to be Reported	21/03/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	25 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	18
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:

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Sample ID	PFAS in Soils Short	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	Misc Soil - Inorg	Acid Extractable metalsin soil	Asbestos ID - soils	Misc Inorg - Soil	CEC	PFAS in TCLP Short
BH003-0-0.1		✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH003-0.5-0.6		✓	✓	✓					✓				
BH101-0.1-0.2		✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH102-0.1-0.2		✓	✓	✓					✓	✓	✓	✓	
BH102-0.4-0.5		✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH105-0.4-0.5		✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH105-0.9-1		✓	✓	✓					✓	✓			
BH107-0-0.2		✓	✓	✓					✓	✓			
BH107-0.6		✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH108-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH109-0.4-0.5		✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH110-0-0.2		✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH110-0.4-0.5		✓	✓	✓					✓				
BH111-0-0.2		✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH111-0.8-1.2		✓	✓	✓					✓	✓			
BH112-0-0.2		✓	✓	✓					✓	✓			
BH112-0.4-0.6		✓	✓	✓	✓	✓	✓	✓	✓	✓			
BH113-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
BH114-0-0.2		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BH115-0-0.2		✓	✓	✓					✓	✓			
BH115-0.4-0.5		✓	✓	✓					✓				
BH116-0-0.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
BD05		✓	✓	✓					✓				
Spike		✓											
Blank		✓											

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 291682

Client Details

Client	Douglas Partners Pty Ltd
Attention	Kurt Plambeck
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**84503.02, Emu Plains**
Number of Samples	6 Water
Date samples received	23/03/2022
Date completed instructions received	23/03/2022

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	30/03/2022
Date of Issue	06/05/2022
Reissue Details	This report replaces R00 due to an amendment to sample ID ELS #1

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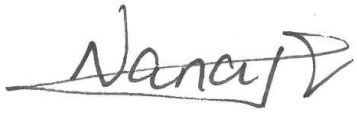
Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Josh Williams, Organics and LC Supervisor
Steven Luong, Senior Chemist

Authorised By



Nancy Zhang, Laboratory Manager

PFAS in Water LOW LEVEL Extend			
Our Reference		291682-1	291682-2
Your Reference	UNITS	BH100	BH102
Date Sampled		23/03/2022	23/03/2022
Type of sample		Water	Water
Date prepared	-	25/03/2022	25/03/2022
Date analysed	-	28/03/2022	25/03/2022
Perfluorobutanesulfonic acid	µg/L	0.009	0.01
Perfluoropentanesulfonic acid	µg/L	0.003	0.003
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.014	0.032
Perfluoroheptanesulfonic acid	µg/L	<0.001	<0.001
Perfluorooctanesulfonic acid PFOS	µg/L	0.003	0.015
Perfluorodecanesulfonic acid	µg/L	<0.002	<0.002
Perfluorobutanoic acid	µg/L	0.008	0.028
Perfluoropentanoic acid	µg/L	0.003	0.035
Perfluorohexanoic acid	µg/L	0.002	0.032
Perfluoroheptanoic acid	µg/L	<0.001	0.018
Perfluorooctanoic acid PFOA	µg/L	0.002	0.028
Perfluorononanoic acid	µg/L	<0.001	0.001
Perfluorodecanoic acid	µg/L	<0.002	<0.002
Perfluoroundecanoic acid	µg/L	<0.002	<0.002
Perfluorododecanoic acid	µg/L	<0.005	<0.005
Perfluorotridecanoic acid	µg/L	<0.01	<0.01
Perfluorotetradecanoic acid	µg/L	<0.05	<0.05
4:2 FTS	µg/L	<0.001	<0.001
6:2 FTS	µg/L	<0.001	0.002
8:2 FTS	µg/L	<0.002	<0.002
10:2 FTS	µg/L	<0.002	<0.002
Perfluorooctane sulfonamide	µg/L	<0.01	<0.01
N-Methyl perfluorooctane sulfonamide	µg/L	<0.005	<0.005
N-Ethyl perfluorooctanesulfon amide	µg/L	<0.01	<0.01
N-Me perfluorooctanesulfonamid oethanol	µg/L	<0.005	<0.005
N-Et perfluorooctanesulfonamid oethanol	µg/L	<0.05	<0.05
MePerfluorooctanesulf- amid oacetic acid	µg/L	<0.002	<0.002
EtPerfluorooctanesulf- amid oacetic acid	µg/L	<0.002	<0.002
Surrogate $^{13}C_8$ *PFOS*	%	91	101
Surrogate $^{13}C_2$ *PFOA*	%	108	114
Extracted ISTD $^{13}C_3$ *PFBS*	%	75	68
Extracted ISTD $^{18}O_2$ *PFHxS*	%	66	72
Extracted ISTD $^{13}C_4$ *PFOS*	%	60	97
Extracted ISTD $^{13}C_4$ *PFBA*	%	40	82

PFAS in Water LOW LEVEL Extend			
Our Reference	UNITS	291682-1	291682-2
Your Reference		BH100	BH102
Date Sampled		23/03/2022	23/03/2022
Type of sample		Water	Water
Extracted ISTD $^{13}C_3$ *PFPeA*	%	74	96
Extracted ISTD $^{13}C_2$ *PFHxA*	%	91	26
Extracted ISTD $^{13}C_4$ *PFHpA*	%	84	107
Extracted ISTD $^{13}C_4$ *PFOA*	%	85	50
Extracted ISTD $^{13}C_5$ *PFNA*	%	83	61
Extracted ISTD $^{13}C_2$ *PFDA*	%	89	100
Extracted ISTD $^{13}C_2$ *PFUnDA*	%	59	105
Extracted ISTD $^{13}C_2$ *PFDoDA*	%	46	154
Extracted ISTD $^{13}C_2$ *PFTeDA*	%	37	137
Extracted ISTD $^{13}C_2$ *4:2FTS*	%	111	53
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	95	78
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	99	137
Extracted ISTD $^{13}C_8$ *FOSA*	%	#	64
Extracted ISTD d_3 *N MeFOSA*	%	#	44
Extracted ISTD d_5 *N EtFOSA*	%	#	55
Extracted ISTD d_7 *N MeFOSE*	%	#	77
Extracted ISTD d_9 *N EtFOSE*	%	#	78
Extracted ISTD d_3 *N MeFOSAA*	%	73	104
Extracted ISTD d_5 *N EtFOSAA*	%	87	128
Total Positive PFHxS & PFOS	µg/L	0.017	0.047
Total Positive PFOA & PFOS	µg/L	0.006	0.043
Total Positive PFAS	µg/L	0.046	0.20

vTRH(C6-C10)/BTEXN in Water						
Our Reference		291682-1	291682-2	291682-3	291682-4	291682-5
Your Reference	UNITS	BH100	BH102	BD1/20220323	Spike	Blank
Date Sampled		23/03/2022	23/03/2022	23/03/2022	23/03/2022	23/03/2022
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	24/03/2022	24/03/2022	24/03/2022	24/03/2022	24/03/2022
Date analysed	-	25/03/2022	25/03/2022	25/03/2022	25/03/2022	25/03/2022
TRH C_6 - C_9	µg/L	<10	<10	<10	[NA]	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10	[NA]	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	[NA]	<10
Benzene	µg/L	<1	<1	<1	82%	<1
Toluene	µg/L	<1	<1	<1	75%	<1
Ethylbenzene	µg/L	<1	<1	<1	90%	<1
m+p-xylene	µg/L	<2	<2	<2	83%	<2
o-xylene	µg/L	<1	<1	<1	96%	<1
Naphthalene	µg/L	<1	<1	<1	[NA]	<1
Surrogate Dibromofluoromethane	%	93	95	92	94	92
Surrogate toluene-d8	%	93	95	92	96	92
Surrogate 4-BFB	%	102	102	101	100	103

vTRH(C6-C10)/BTEXN in Water		
Our Reference		291682-6
Your Reference	UNITS	Rinsate
Date Sampled		23/03/2022
Type of sample		Water
Date extracted	-	24/03/2022
Date analysed	-	25/03/2022
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	92
Surrogate toluene-d8	%	93
Surrogate 4-BFB	%	104

svTRH (C10-C40) in Water					
Our Reference	UNITS	291682-1	291682-2	291682-3	291682-6
Your Reference		BH100	BH102	BD1/20220323	Rinsate
Date Sampled		23/03/2022	23/03/2022	23/03/2022	23/03/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	25/03/2022	25/03/2022	25/03/2022	25/03/2022
Date analysed	-	25/03/2022	25/03/2022	25/03/2022	25/03/2022
TRH C_{10} - C_{14}	µg/L	<100	<50	71	<50
TRH C_{15} - C_{28}	µg/L	<200	<100	240	<100
TRH C_{29} - C_{36}	µg/L	<200	<100	140	<100
Total +ve TRH (C10-C36)	µg/L	<100	<50	450	<50
TRH >C_{10} - C_{16}	µg/L	<100	<50	74	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<100	<50	74	<50
TRH >C_{16} - C_{34}	µg/L	<200	120	320	<100
TRH >C_{34} - C_{40}	µg/L	<200	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<100	120	390	<50
Surrogate o-Terphenyl	%	#	85	79	109

PAHs in Water - Low Level					
Our Reference	UNITS	291682-1	291682-2	291682-3	291682-6
Your Reference		BH100	BH102	BD1/20220323	Rinsate
Date Sampled		23/03/2022	23/03/2022	23/03/2022	23/03/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	25/03/2022	25/03/2022	25/03/2022	25/03/2022
Date analysed	-	25/03/2022	25/03/2022	25/03/2022	25/03/2022
Naphthalene	µg/L	<0.4	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.2	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.2	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.2	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.2	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.2	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.2	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.2	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.2	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.2	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.4	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.2	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.2	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.2	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.2	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<1	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.2	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	#	68	87	134

OCPs in Water - Trace Level			
Our Reference	UNITS	291682-1	291682-2
Your Reference		BH100	BH102
Date Sampled		23/03/2022	23/03/2022
Type of sample		Water	Water
Date extracted	-	25/03/2022	25/03/2022
Date analysed	-	25/03/2022	25/03/2022
alpha-BHC	µg/L	<0.002	<0.001
HCB	µg/L	<0.002	<0.001
beta-BHC	µg/L	<0.002	<0.001
gamma-BHC	µg/L	<0.002	<0.001
Heptachlor	µg/L	<0.002	<0.001
delta-BHC	µg/L	<0.002	<0.001
Aldrin	µg/L	<0.002	<0.001
Heptachlor Epoxide	µg/L	<0.002	<0.001
gamma-Chlordane	µg/L	<0.002	<0.001
alpha-Chlordane	µg/L	<0.002	<0.001
Endosulfan I	µg/L	<0.004	<0.002
pp-DDE	µg/L	<0.002	<0.001
Dieldrin	µg/L	<0.002	<0.001
Endrin	µg/L	<0.002	<0.001
Endosulfan II	µg/L	<0.004	<0.002
pp-DDD	µg/L	<0.002	<0.001
Endrin Aldehyde	µg/L	<0.002	<0.001
pp-DDT	µg/L	<0.002	<0.001
Endosulfan Sulphate	µg/L	<0.002	<0.001
Methoxychlor	µg/L	<0.002	<0.001
Surrogate TCMX	%	#	64

OP in water Trace ANZECCF/ADWG			
Our Reference	UNITS	291682-1	291682-2
Your Reference		BH100	BH102
Date Sampled		23/03/2022	23/03/2022
Type of sample		Water	Water
Date extracted	-	25/03/2022	25/03/2022
Date analysed	-	25/03/2022	25/03/2022
Dichlorovos	µg/L	<0.4	<0.2
Dimethoate	µg/L	<0.3	<0.15
Diazinon	µg/L	<0.02	<0.01
Chlorpyriphos-methyl	µg/L	<0.4	<0.2
Methyl Parathion	µg/L	<0.4	<0.2
Ronnel	µg/L	<0.4	<0.2
Fenitrothion	µg/L	<0.4	<0.2
Malathion	µg/L	<0.1	<0.05
Chlorpyriphos	µg/L	<0.02	<0.009
Parathion	µg/L	<0.008	<0.004
Bromophos ethyl	µg/L	<0.4	<0.2
Ethion	µg/L	<0.4	<0.2
Azinphos-methyl (Guthion)	µg/L	<0.04	<0.02
Surrogate TCMX	%	#	64

PCBs in Water - Trace Level			
Our Reference		291682-1	291682-2
Your Reference	UNITS	BH100	BH102
Date Sampled		23/03/2022	23/03/2022
Type of sample		Water	Water
Date extracted	-	25/03/2022	25/03/2022
Date analysed	-	25/03/2022	25/03/2022
Aroclor 1016	µg/L	<0.02	<0.01
Aroclor 1221	µg/L	<0.02	<0.01
Aroclor 1232	µg/L	<0.02	<0.01
Aroclor 1242	µg/L	<0.02	<0.01
Aroclor 1248	µg/L	<0.02	<0.01
Aroclor 1254	µg/L	<0.02	<0.01
Aroclor 1260	µg/L	<0.02	<0.01
Surrogate TCMX	%	#	64

Total Phenolics in Water			
Our Reference		291682-1	291682-2
Your Reference	UNITS	BH100	BH102
Date Sampled		23/03/2022	23/03/2022
Type of sample		Water	Water
Date extracted	-	24/03/2022	24/03/2022
Date analysed	-	24/03/2022	24/03/2022
Total Phenolics (as Phenol)	mg/L	<0.05	<0.05

HM in water - dissolved					
Our Reference	UNITS	291682-1	291682-2	291682-3	291682-6
Your Reference		BH100	BH102	BD1/20220323	Rinsate
Date Sampled		23/03/2022	23/03/2022	23/03/2022	23/03/2022
Type of sample		Water	Water	Water	Water
Date prepared	-	25/03/2022	25/03/2022	25/03/2022	25/03/2022
Date analysed	-	25/03/2022	25/03/2022	25/03/2022	25/03/2022
Arsenic-Dissolved	µg/L	<1	1	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1
Copper-Dissolved	µg/L	13	32	5	<1
Lead-Dissolved	µg/L	<1	<1	<1	<1
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	<1	6	<1	<1
Zinc-Dissolved	µg/L	5	13	4	1

Method ID	Methodology Summary
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-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
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-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
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. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-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 5.3 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: PFAS in Water LOW LEVEL Extend						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	291682-2
Date prepared	-			28/03/2022	1	25/03/2022	29/03/2022		25/03/2022	25/03/2022
Date analysed	-			28/03/2022	1	28/03/2022	29/03/2022		25/03/2022	25/03/2022
Perfluorobutanesulfonic acid	µg/L	0.001	Org-029	<0.001	1	0.009	0.008	12	99	97
Perfluoropentanesulfonic acid	µg/L	0.001	Org-029	<0.001	1	0.003	0.003	0	129	124
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.001	Org-029	<0.001	1	0.014	0.014	0	103	100
Perfluoroheptanesulfonic acid	µg/L	0.001	Org-029	<0.001	1	<0.001	<0.001	0	129	131
Perfluorooctanesulfonic acid PFOS	µg/L	0.001	Org-029	<0.001	1	0.003	0.002	40	103	112
Perfluorodecanesulfonic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	71	126
Perfluorobutanoic acid	µg/L	0.002	Org-029	<0.002	1	0.008	0.008	0	103	88
Perfluoropentanoic acid	µg/L	0.002	Org-029	<0.002	1	0.003	0.003	0	101	114
Perfluorohexanoic acid	µg/L	0.001	Org-029	<0.001	1	0.002	0.002	0	102	99
Perfluoroheptanoic acid	µg/L	0.001	Org-029	<0.001	1	<0.001	<0.001	0	105	101
Perfluorooctanoic acid PFOA	µg/L	0.001	Org-029	<0.001	1	0.002	0.001	67	94	102
Perfluorononanoic acid	µg/L	0.001	Org-029	<0.001	1	<0.001	<0.001	0	110	111
Perfluorodecanoic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	106	90
Perfluoroundecanoic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	96	99
Perfluorododecanoic acid	µg/L	0.005	Org-029	<0.005	1	<0.005	<0.005	0	119	96
Perfluorotridecanoic acid	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.01	0	93	91
Perfluorotetradecanoic acid	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.05	0	97	100
4:2 FTS	µg/L	0.001	Org-029	<0.001	1	<0.001	<0.001	0	101	85
6:2 FTS	µg/L	0.001	Org-029	<0.001	1	<0.001	<0.001	0	97	107
8:2 FTS	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	105	102
10:2 FTS	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	128	##
Perfluorooctane sulfonamide	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.1	164	110	97
N-Methyl perfluorooctane sulfonamide	µg/L	0.005	Org-029	<0.005	1	<0.005	<0.05	164	102	103
N-Ethyl perfluorooctanesulfon amide	µg/L	0.01	Org-029	<0.01	1	<0.01	<0.1	164	90	86
N-Me perfluorooctanesulfonamid oethanol	µg/L	0.005	Org-029	<0.005	1	<0.005	<0.05	164	95	95
N-Et perfluorooctanesulfonamid oethanol	µg/L	0.05	Org-029	<0.05	1	<0.05	<0.5	164	94	98
MePerfluorooctanesulf- amid oacetic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	104	100
EtPerfluorooctanesulf- amid oacetic acid	µg/L	0.002	Org-029	<0.002	1	<0.002	<0.002	0	113	103
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	95	1	91	92	1	98	100
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	105	1	108	108	0	100	118

QUALITY CONTROL: PFAS in Water LOW LEVEL Extend						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	291682-2
Extracted ISTD $^{13}C_3$ *PFBS*	%		Org-029	87	1	75	80	6	87	68
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	83	1	66	73	10	72	71
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	88	1	60	94	44	82	95
Extracted ISTD $^{13}C_4$ *PFBA*	%		Org-029	102	1	40	35	13	98	#
Extracted ISTD $^{13}C_3$ *PFPeA*	%		Org-029	95	1	74	70	6	90	#
Extracted ISTD $^{13}C_2$ *PFHxA*	%		Org-029	100	1	91	90	1	96	26
Extracted ISTD $^{13}C_4$ *PFHpA*	%		Org-029	96	1	84	90	7	90	31
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	99	1	85	92	8	100	47
Extracted ISTD $^{13}C_5$ *PFNA*	%		Org-029	101	1	83	100	19	91	60
Extracted ISTD $^{13}C_2$ *PFDA*	%		Org-029	103	1	89	115	25	95	103
Extracted ISTD $^{13}C_2$ *PFUnDA*	%		Org-029	99	1	59	88	39	89	98
Extracted ISTD $^{13}C_2$ *PFDoDA*	%		Org-029	97	1	46	112	84	87	153
Extracted ISTD $^{13}C_2$ *PFTeDA*	%		Org-029	76	1	37	89	83	74	138
Extracted ISTD $^{13}C_2$ *4:2FTS*	%		Org-029	134	1	111	82	30	102	66
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	98	1	95	90	5	102	78
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	99	1	99	99	0	101	140
Extracted ISTD $^{13}C_8$ *FOSA*	%		Org-029	77	1	#	#		74	61
Extracted ISTD d_3 *N MeFOSA*	%		Org-029	39	1	#	#		30	40
Extracted ISTD d_5 *N EtFOSA*	%		Org-029	38	1	#	#		31	52
Extracted ISTD d_7 *N MeFOSE*	%		Org-029	58	1	#	#		62	72

QUALITY CONTROL: PFAS in Water LOW LEVEL Extend						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	291682-2
Extracted ISTD d_9 *N EtFOSE*	%		Org-029	57	1	#	#		60	77
Extracted ISTD d_3 *N MeFOSAA*	%		Org-029	117	1	73	62	16	117	106
Extracted ISTD d_5 *N EtFOSAA*	%		Org-029	125	1	87	81	7	90	127

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Date analysed	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	94	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	94	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	94	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	93	[NT]	[NT]	[NT]	[NT]	103	[NT]
Surrogate toluene-d8	%		Org-023	94	[NT]	[NT]	[NT]	[NT]	101	[NT]
Surrogate 4-BFB	%		Org-023	103	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	291682-6
Date extracted	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	25/03/2022
Date analysed	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	26/03/2022
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	94	94
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	88	89
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	109	126
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	94	94
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	88	89
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	109	126
Surrogate o-Terphenyl	%		Org-020	108	[NT]	[NT]	[NT]	[NT]	111	98

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	[NT]
Date analysed	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	[NT]
Naphthalene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	88	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	93	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	94	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	79	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	64	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	71	[NT]	[NT]	[NT]	[NT]	73	[NT]

QUALITY CONTROL: OCPs in Water - Trace Level					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	[NT]
Date analysed	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	[NT]
alpha-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	97	[NT]
HCB	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	103	[NT]
gamma-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	103	[NT]
delta-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	105	[NT]
Heptachlor Epoxide	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	110	[NT]
gamma-Chlordane	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-Chlordane	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	µg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	104	[NT]
Dieldrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	104	[NT]
Endrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	125	[NT]
Endosulfan II	µg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	105	[NT]
Endrin Aldehyde	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	100	[NT]
Methoxychlor	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	75	[NT]	[NT]	[NT]	[NT]	84	[NT]

QUALITY CONTROL: OP in water Trace ANZECCF/ADWG						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	[NT]
Date analysed	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	[NT]
Dichlorovos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	78	[NT]
Dimethoate	µg/L	0.15	Org-022/025	<0.15	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	µg/L	0.01	Org-022/025	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos-methyl	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methyl Parathion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	110	[NT]
Fenitrothion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	93	[NT]
Malathion	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	124	[NT]
Chlorpyriphos	µg/L	0.009	Org-022/025	<0.009	[NT]	[NT]	[NT]	[NT]	116	[NT]
Parathion	µg/L	0.004	Org-022/025	<0.004	[NT]	[NT]	[NT]	[NT]	93	[NT]
Bromophos ethyl	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	98	[NT]
Azinphos-methyl (Guthion)	µg/L	0.02	Org-022/025	<0.02	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	67	[NT]	[NT]	[NT]	[NT]	84	[NT]

QUALITY CONTROL: PCBs in Water - Trace Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	[NT]
Date analysed	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	[NT]
Aroclor 1016	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	110	[NT]
Aroclor 1260	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	67	[NT]	[NT]	[NT]	[NT]	84	[NT]

QUALITY CONTROL: Total Phenolics in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Date analysed	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-031	<0.05	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W4	[NT]
Date prepared	-			25/03/2022	1	25/03/2022	25/03/2022		25/03/2022	[NT]
Date analysed	-			25/03/2022	1	25/03/2022	25/03/2022		25/03/2022	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	95	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	97	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	91	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	13	13	0	93	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	98	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	[NT]		113	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	93	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	5	4	22	93	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Report Comments

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).

MeFOSA and EtFOSA Extracted Internal Standard is outside of global acceptance criteria (50-150%) for (LCS and/or MB) but within analyte specific acceptance criteria.

PFAS in Water:
Matrix spike recovery (147%) for 10:2 FTS is outside global acceptance criteria (60-140%). However an acceptable recovery has been obtained for the LCS.

TRH Water(C10-C40) NEPM - # Percent recovery for the surrogate is not possible to report due to interference from analytes (other than those being tested) in sample 291682-1.
The PQL has been raised due to interferences from analytes (other than those being tested) in sample/s 291682-1.

PAH_W_LL:# Percent recovery for the surrogate is not possible to report due to interference from analytes (other than those being tested) in sample 291682-1.
The PQL has been raised due to interferences from analytes (other than those being tested) in sample/s 291682-1.

OCP_W_TRACE_MS:# Percent recovery for the surrogate is not possible to report due to interference from analytes (other than those being tested) in sample 291682-1.
The PQL has been raised due to interferences from analytes (other than those being tested) in sample/s 291682-1.

OP_W_TRACE_SYD:# Percent recovery for the surrogate is not possible to report due to interference from analytes (other than those being tested) in sample 291682-1.
The PQL has been raised due to interferences from analytes (other than those being tested) in sample/s 291682-1.

PCB_W_TRACE:# Percent recovery for the surrogate is not possible to report due to interference from analytes (other than those being tested) in sample 291682-1.
The PQL has been raised due to interferences from analytes (other than those being tested) in sample/s 291682-1.

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	84503.02	**Suburb:**	Emu Plains	**To:**	*Envirolab Services*
Project Manager:	Kurt Plambeck	**Order Number:**		**Sampler:**	VV		*12 Ashley St, Chatswood NSW 2067*
Email:	Kurt.Plambeck@douglaspartners.com.au					**Attn:**	*Sample Receipt*
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day					**Contact:**	*(02) 9910 6200 samplereceipt@envirolab.com.au*
Prior Storage:	☐ Fridge ☐ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?**	☐ No ☐ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)				

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: 8 metals	TRH	Low level PAH	BTEX	Trace OCP, OPP, PCB	VOC	phenols	PFAS (low)				Notes/ Preservation/ Additional Requirements
1	BH 106	3.2	3.7	23.3.22	W	G/P	X	X	X		X		X	X				Metals filtered
2	BH 103	3.0	3.5	23.3.22	W	G/P	X	X	X		X		X	X				Metals filtered
3	BD1/2022			23.3.22	W	G/P	X	X	X									Metals filtered.
4	03.23																	
4	spike									X								
5	blank									X								
6	Rinsate VV			23.3.22	W	G/P												Metals filtered.
																		inter-lab
3	BD1/20220323						X	X	X									intra-lab

ENVIRONMENTAL
Job No: 291682
Date Received: 23-3-2022
Time Received: 1530
Received by: JJ HW
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

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

Metals to analyse:			
Number of samples in container:		**Transported to laboratory by:**	VV
Send results to:	Douglas Partners Pty Ltd		
Address:	96 Hermitage Road, West Ryde NSW 2114	**Phone:**	(02) 9809 0666
Relinquished by:	VV	**Date:**	23.3.22
		Signed:	

LAB RECEIPT

Lab Ref. No:	291682
Received by:	JJ HW
Date & Time:	23.3.2022 1530
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	Kurt Plambeck

Sample Login Details

Your reference	84503.02, Emu Plains
Envirolab Reference	291682
Date Sample Received	23/03/2022
Date Instructions Received	23/03/2022
Date Results Expected to be Reported	30/03/2022

Sample Condition

Samples received in appropriate condition for analysis	7
No. of Samples Provided	6 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	13
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Scheduled TRH/PAH/Metals for Rinsate

Please contact the laboratory within 24 hours if you wish to cancel the aformentioned testing. Otherwise testing will proceed as per the COC and hence invoice accordingly.

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	PFAS in Water LOW LEVEL Extend	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water - Low Level	OCPs in Water - Trace Level	OP in water Trace ANZECCF/ADWG	PCBs in Water - Trace Level	Total Phenolics in Water	HM in water - dissolved
BH106	✓	✓	✓	✓	✓	✓	✓	✓	✓
BH102	✓	✓	✓	✓	✓	✓	✓	✓	✓
BD1/20220323		✓	✓	✓					✓
Spike		✓							
Blank		✓							
Rinsate		✓	✓	✓					✓

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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2208924**	Page	: 1 of 6
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR KURT PLAMBECK	Contact	: Sepan Mahamad
Address	: 96 HERMITAGE ROAD WEST RYDE NSW, AUSTRALIA 2114	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9809 0666	Telephone	: +61 2 8784 8555
Project	: ----	Date Samples Received	: 14-Mar-2022 16:20
Order number	: 84503.02	Date Analysis Commenced	: 16-Mar-2022
C-O-C number	: ----	Issue Date	: 21-Mar-2022 15:29
Sampler	: RM		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		

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 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 Contact 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	BD01	BD02	----	----	----
			Sampling date / time	11-Mar-2022 00:00	11-Mar-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2208924-001	ES2208924-002	--------	--------	--------
				Result	Result	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)								
Moisture Content	----	1.0	%	**12.7**	**14.6**	----	----	----
EG005(ED093)T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	<5	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg	**9**	**13**	----	----	----
Copper	7440-50-8	5	mg/kg	**8**	**8**	----	----	----
Lead	7439-92-1	5	mg/kg	**12**	**11**	----	----	----
Nickel	7440-02-0	2	mg/kg	**4**	**7**	----	----	----
Zinc	7440-66-6	5	mg/kg	**16**	**23**	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	<0.5	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	<0.5	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	<0.5	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	<0.5	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	<0.5	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	<0.5	----	----	----
^ Benzo(a)pyrene TEQ (half LOR)	----	0.5	mg/kg	**0.6**	**0.6**	----	----	----
^ Benzo(a)pyrene TEQ (LOR)	----	0.5	mg/kg	**1.2**	**1.2**	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	<10	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BD01	BD02	----	----	----
				Sampling date / time	11-Mar-2022 00:00	11-Mar-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2208924-001	ES2208924-002	--------	--------	--------
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C10 - C14 Fraction	----	50	mg/kg		<50	<50	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	<100	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		<50	<50	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	<10	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	<10	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		<50	<50	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	<100	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	<100	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	<50	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	<50	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	<0.2	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	<0.5	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	<0.5	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	<0.5	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	<0.5	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	<0.2	----	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	<0.5	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	<1	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**85.1**	**82.6**	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**86.4**	**84.0**	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**70.9**	**68.0**	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**99.8**	**97.3**	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**105**	**102**	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**96.5**	**94.5**	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**88.5**	**91.4**	----	----	----
Toluene-D8	2037-26-5	0.2	%		**85.6**	**90.9**	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)			Sample ID	BD01	BD02	----	----	----
			Sampling date / time	11-Mar-2022 00:00	11-Mar-2022 00:00	----	----	----
Compound	CAS Number	LOR	Unit	ES2208924-001	ES2208924-002	--------	--------	--------
				Result	Result	----	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued								
4-Bromofluorobenzene	460-00-4	0.2	%	**95.3**	**92.2**	**----**	**----**	**----**

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	73	133
Toluene-D8	2037-26-5	74	132
4-Bromofluorobenzene	460-00-4	72	130

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES2208924**	Page	: 1 of 7
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR KURT PLAMBECK	Contact	: Sepan Mahamad
Address	: 96 HERMITAGE ROAD WEST RYDE NSW, AUSTRALIA 2114	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 02 9809 0666	Telephone	: +61 2 8784 8555
Project	: ----	Date Samples Received	: 14-Mar-2022
Order number	: 84503.02	Date Analysis Commenced	: 16-Mar-2022
C-O-C number	: ----	Issue Date	: 21-Mar-2022
Sampler	: RM		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 2		
No. of samples analysed	: 2		

ilac-MRA NATA
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 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 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

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: 4231377)									
ES2206674-048	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	23	15	40.9	0% - 50%
		EG005T: Nickel	7440-02-0	2	mg/kg	13	12	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	12	8	46.1	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	23	20	16.1	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	25	21	17.8	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	44	35	21.5	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4231380)									
ES2208924-002	BD02	EA055: Moisture Content	----	0.1	%	14.6	15.0	3.0	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4231376)									
ES2206674-048	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 4231053)									
ES2209009-008	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

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: 4231053) - continued									
ES2209009-008	Anonymous	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
ES2209009-001	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: 4231013)									
ES2208924-001	BD01	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EW2201247-006	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4231054)									
ES2209009-008	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
ES2209009-001	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

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 (%)*
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4231013)									
ES2208924-001	BD01	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EW2201247-006	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4231054)									
ES2209009-008	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
ES2209009-001	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: BTEXN (QC Lot: 4231013)									
ES2208924-001	BD01	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
EW2201247-006	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: 4231377)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	105	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	89.4	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	110	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	101	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	105	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	94.6	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4231376)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	103	70.0	125
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4231053)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	92.1	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	85.0	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	91.4	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	94.0	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	86.0	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	92.9	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	93.9	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	86.8	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	89.9	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	83.2	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	91.7	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	77.9	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	80.0	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	79.2	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	76.7	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4231013)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	89.2	68.4	128
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4231054)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	89.2	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	91.1	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	91.4	71.0	129
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4231013)								

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 Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4231013) - continued								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	90.9	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4231054)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	89.8	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	91.6	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	84.5	63.0	131
EP080: BTEXN (QCLot: 4231013)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	103	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	102	67.0	121
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	100	65.0	117
EP080: meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	2 mg/kg	98.3	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	102	68.0	120
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	91.4	63.0	119

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: 4231377)							
ES2206674-048	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	86.0	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	93.1	70.0	130
		EG005T: Chromium	7440-47-3	50 mg/kg	80.7	68.0	132
		EG005T: Copper	7440-50-8	250 mg/kg	93.4	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	92.2	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	92.1	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	91.9	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4231376)							
ES2206674-048	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	96.3	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4231053)							
ES2209009-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	95.2	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	102	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4231013)							
ES2208924-001	BD01	EP080: C6 - C9 Fraction	----	32.5 mg/kg	94.3	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4231054)							

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: 4231054) - continued							
ES2209009-001	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	95.3	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	101	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	109	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4231013)							
ES2208924-001	BD01	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	93.0	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4231054)							
ES2209009-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	97.4	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	104	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	108	52.0	132
EP080: BTEXN (QCLot: 4231013)							
ES2208924-001	BD01	EP080: Benzene	71-43-2	2.5 mg/kg	89.2	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	95.6	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	92.4	70.0	130
		EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	91.1	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	90.5	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	91.1	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2208924**	Page	: 1 of 4
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR KURT PLAMBECK	Telephone	: +61 2 8784 8555
Project	: ----	Date Samples Received	: 14-Mar-2022
Site	: ----	Issue Date	: 21-Mar-2022
Sampler	: RM	No. of samples received	: 2
Order number	: 84503.02	No. of samples analysed	: 2

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)							
BD01, BD02	**11-Mar-2022**	**----**	----	----	**16-Mar-2022**	25-Mar-2022	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
BD01, BD02	**11-Mar-2022**	**17-Mar-2022**	07-Sep-2022	✓	**18-Mar-2022**	07-Sep-2022	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
BD01, BD02	**11-Mar-2022**	**17-Mar-2022**	08-Apr-2022	✓	**18-Mar-2022**	08-Apr-2022	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
BD01, BD02	**11-Mar-2022**	**18-Mar-2022**	25-Mar-2022	✓	**19-Mar-2022**	27-Apr-2022	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
BD01, BD02	**11-Mar-2022**	**16-Mar-2022**	25-Mar-2022	✓	**18-Mar-2022**	25-Mar-2022	✓
Soil Glass Jar - Unpreserved (EP071)							
BD01, BD02	**11-Mar-2022**	**18-Mar-2022**	25-Mar-2022	✓	**19-Mar-2022**	27-Apr-2022	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
BD01, BD02	**11-Mar-2022**	**16-Mar-2022**	25-Mar-2022	✓	**18-Mar-2022**	25-Mar-2022	✓
Soil Glass Jar - Unpreserved (EP071)							
BD01, BD02	**11-Mar-2022**	**18-Mar-2022**	25-Mar-2022	✓	**19-Mar-2022**	27-Apr-2022	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
BD01, BD02	**11-Mar-2022**	**16-Mar-2022**	25-Mar-2022	✓	**18-Mar-2022**	25-Mar-2022	✓

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	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PAH/Phenols (SIM)	EP075(SIM)	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	10	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	2	11	**18.18**	**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	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	**9.09**	**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	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	**9.09**	**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	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	10	**10.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	11	**9.09**	**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.

SAMPLE RECEIPT NOTIFICATION (SRN)

Work Order : **ES2208924**

Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR KURT PLAMBECK	Contact	: Sepan Mahamad
Address	: 96 HERMITAGE ROAD WEST RYDE NSW, AUSTRALIA 2114	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: kurt.plambeck@douglaspartners.com.au	E-mail	: Sepan.Mahamad@ALSGlobal.com
Telephone	: +61 02 9809 0666	Telephone	: +61 2 8784 8555
Facsimile	: +61 02 9809 4095	Facsimile	: +61-2-8784 8500
Project	: ----	Page	: 1 of 2
Order number	: 84503.02	Quote number	: EM2017DOUPAR0002 (EN/222)
C-O-C number	: ----	QC Level	: NEPM 2013 B3 & ALS QC Standard
Site	: ----		
Sampler	: RM		

Dates

Date Samples Received	: 14-Mar-2022 16:20	Issue Date	: 16-Mar-2022
Client Requested Due Date	: 21-Mar-2022	Scheduled Reporting Date	: **21-Mar-2022**

Delivery Details

Mode of Delivery	: Carrier	Security Seal	: Intact.
No. of coolers/boxes	: ----	Temperature	: 8.1'C - Ice Bricks present
Receipt Detail	: 1 FOAM ESKY	No. of samples received / analysed	: 2 / 2

General Comments

- This report contains the following information:
  - Sample Container(s)/Preservation Non-Compliances
  - Summary of Sample(s) and Requested Analysis
  - Proactive Holding Time Report
  - Requested Deliverables
- **Please refer to the Proactive Holding Time Report table below which summarises breaches of recommended holding times that have occurred prior to samples/instructions being received at the laboratory. The laboratory will process these samples unless instructions are received from you indicating you do not wish to proceed. The absence of this summary table indicates that all samples have been received within the recommended holding times for the analysis requested.**
- **Sample(s) requiring volatile organic compound analysis received in airtight containers (ZHE).**
- Please direct any queries you have regarding this work order to the above ALS laboratory contact.
- Analytical work for this work order will be conducted at ALS Sydney.
- Sample Disposal - Aqueous (3 weeks), Solid (2 months ± 1 week) from receipt of samples.
- Please be aware that APHA/NEPM recommends water and soil samples be chilled to less than or equal to 6°C for chemical analysis, and less than or equal to 10°C but unfrozen for Microbiological analysis. Where samples are received above this temperature, it should be taken into consideration when interpreting results. Refer to ALS EnviroMail 85 for ALS recommendations of the best practice for chilling samples after sampling and for maintaining a cool temperature during transit.

Sample Container(s)/Preservation Non-Compliances

All comparisons are made against pretreatment/preservation AS, APHA, USEPA standards.

- **No sample container / preservation non-compliance exists.**

Summary of Sample(s) and Requested Analysis

Some items described below may be part of a laboratory process necessary for the execution of client requested tasks. Packages may contain additional analyses, such as the determination of moisture content and preparation tasks, that are included in the package.
If no sampling time is provided, the sampling time will default 00:00 on the date of sampling. If no sampling date is provided, the sampling date will be assumed by the laboratory and displayed in brackets without a time component

Matrix: **SOIL**

Laboratory sample ID	Sampling date / time	Sample ID	SOIL - EA055-103 Moisture Content	SOIL - S-26 8 metals/TRH/BTEXN/PAH
ES2208924-001	11-Mar-2022 00:00	BD01	✓	✓
ES2208924-002	11-Mar-2022 00:00	BD02	✓	✓

Proactive Holding Time Report

Sample(s) have been received within the recommended holding times for the requested analysis.

Requested Deliverables

ACCOUNTS PAYABLE INVOICES

- A4 - AU Tax Invoice (INV)	Email	apinvoices@douglaspartners.com.au

KURT PLAMBECK

- *AU Certificate of Analysis - NATA (COA)	Email	kurt.plambeck@douglaspartners.com.au
- *AU Interpretive QC Report - DEFAULT (Anon QCI Rep) (QCI)	Email	kurt.plambeck@douglaspartners.com.au
- *AU QC Report - DEFAULT (Anon QC Rep) - NATA (QC)	Email	kurt.plambeck@douglaspartners.com.au
- A4 - AU Sample Receipt Notification - Environmental HT (SRN)	Email	kurt.plambeck@douglaspartners.com.au
- Chain of Custody (CoC) (COC)	Email	kurt.plambeck@douglaspartners.com.au
- EDI Format - ESDAT (ESDAT)	Email	kurt.plambeck@douglaspartners.com.au
- EDI Format - XTab (XTAB)	Email	kurt.plambeck@douglaspartners.com.au

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	84503.02	**Suburb:**	Emu Plains	**To:**	*ALS*
Project Manager:	Kurt Plambeck	**Order Number:**		**Sampler:**	RM
Email:	Kurt.Plambeck@douglaspartners.com.au			**Attn:**	
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day			**Contact:**	
Prior Storage:	☐ Fridge ☐ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?**	☐ No ☐ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: TRH	BTEX	PAH	8 metals							Notes/ Preservation/ Additional Requirements
	BD01						X	X	X	X							
	BD02						X	X	X	X							

Environmental Division
Sydney
Work Order Reference
ES2208924

Telephone : +61-2-8784 8555

Metals to analyse:			**LAB RECEIPT**
Number of samples in container:		**Transported to laboratory by:**	**Lab Ref. No:**
Send results to:	Douglas Partners Pty Ltd		**Received by:**
Address:	96 Hermitage Road, West Ryde NSW 2114	**Phone:** (02) 9809 0666	**Date & Time:**
Relinquished by:	KP 14/3 Ham	**Date:** **Signed:**	**Signed:**

Rec - SOffice 14/3/22 1620 SF

Appendix I

Quality Assurance / Quality Control

Appendix I
Quality Assurance / Quality Control
1-3 Emerald Street and 6-8 Troy Street, Emu Plains

I1.0 Field and Laboratory Data Quality Assurance and Quality Control

The field and laboratory data quality assurance and quality control (QA / QC) procedures and results are summarised in the following Table 1. Reference should be made to the field work methodology and the laboratory results / certificates of analysis for further details. The relative percentage difference (RPD) results, along with the other field QC samples are included in 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% 10% of primary samples; <30% RPD Refer to Table QA1 and QA2 following this appendix	C
Inter-laboratory replicates	5% of primary samples; <30% RPD Refer to Table QA1 following this appendix	C
Trip Spikes	1 per sampling event; 60-140% recovery Refer to Table QA3 following this appendix	C
Trip Blanks	1 per sampling event; <PQL Refer to Table QA4 following this appendix	C
Rinsates	1 per sampling event; <PQL with exception of trace concentration of zinc at reporting limit (1 µg/L). Refer to Table QA5 following this appendix	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

Item	Evaluation / Acceptance Criteria	Compliance
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 of intra-laboratory and inter-laboratory samples were all within the acceptable range, with the exception of those indicated in Tables QA1 and QA2 (bold). The exceedances are not, however, considered to be of concern given that:

- The typically low actual differences in the concentrations of the replicate pairs where some RPD exceedances occurred, particularly for groundwater;
- The number of replicate pairs being collected from fill soils which by its nature is heterogeneous;
- Replicates, rather than homogenised duplicates, were used to minimise risk of volatile loss, hence greater variability can be expected;
- Most of the recorded concentrations being relatively close to the PQL;
- The majority of RPDs within a replicate pair being within the acceptable limits; and
- All other QA / QC parameters met the DQIs.

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

I2.0 Data Quality Indicators

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

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

Table 2: Data Quality Indicators

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

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

I3.0 Conclusion

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

I4.0 References

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

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Table QA2: Relative Percentage Difference Results – Groundwater

ChemName	Units	EQL	BH10	BD1/20220323	RPD
Benzo(a)pyrene TEQ	µg/L	0.5	<1.0	<0.5	0
Benzo(b,j+k)fluoranthene	µg/L	0.2	<0.4	<0.2	0
Total +ve PAHs	µg/L	0.1	<0.2	<0.1	0
Arsenic (Filtered)	mg/l	0.001	<0.001	<0.001	0
Cadmium (Filtered)	mg/l	0.0001	<0.0001	<0.0001	0
Chromium (III+VI) (Filtered)	mg/l	0.001	<0.001	<0.001	0
Copper (Filtered)	mg/l	0.001	**0.013**	**0.005**	**89**
Lead (Filtered)	mg/l	0.001	<0.001	<0.001	0
Mercury (Filtered)	mg/l	0.00005	<0.0001	<0.0001	0
Nickel (Filtered)	mg/l	0.001	<0.001	<0.001	0
Zinc (Filtered)	mg/l	0.001	0.005	0.004	22
C10-C16	mg/l	0.05	<0.1	0.074	0
C16-C34	mg/l	0.1	<0.2	0.32	46
C34-C40	mg/l	0.1	<0.2	<0.1	0
F2-NAPHTHALENE	mg/l	0.05	<0.1	0.074	0
C6 - C9	mg/l	0.01	<0.01	<0.01	0
C10 - C14	mg/l	0.05	<0.1	0.071	0
C15 - C28	mg/l	0.1	<0.2	0.24	18
C29-C36	mg/l	0.1	<0.2	0.14	0
C6-C10 less BTEX (F1)	mg/l	0.01	<0.01	<0.01	0
C6-C10	mg/l	0.01	<0.01	<0.01	0
Benzene	mg/l	0.001	<0.001	<0.001	0
Ethylbenzene	mg/l	0.001	<0.001	<0.001	0
Toluene	mg/l	0.001	<0.001	<0.001	0
Xylene (m & p)	mg/l	0.002	<0.002	<0.002	0
Xylene (o)	mg/l	0.001	<0.001	<0.001	0
Acenaphthene	mg/l	0.0001	<0.0002	<0.0001	0
Acenaphthylene	mg/l	0.0001	<0.0002	<0.0001	0
Anthracene	mg/l	0.0001	<0.0002	<0.0001	0
Benz(a)anthracene	mg/l	0.0001	<0.0002	<0.0001	0
Benzo(a) pyrene	mg/l	0.0001	<0.0002	<0.0001	0
Benzo(g,h,i)perylene	mg/l	0.0001	<0.0002	<0.0001	0
Chrysene	mg/l	0.0001	<0.0002	<0.0001	0
Dibenz(a,h)anthracene	mg/l	0.0001	<0.0002	<0.0001	0
Fluoranthene	mg/l	0.0001	<0.0002	<0.0001	0
Fluorene	mg/l	0.0001	<0.0002	<0.0001	0
Indeno(1,2,3-c,d)pyrene	mg/l	0.0001	<0.0002	<0.0001	0
Naphthalene	mg/l	0.001	<0.001	<0.001	0
Naphthalene	mg/l	0.0002	<0.0004	<0.0002	0
Phenanthrene	mg/l	0.0001	<0.0002	<0.0001	0
Pyrene	mg/l	0.0001	<0.0002	<0.0001	0

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Table QA3: Trip Spike Results – Soils (% Recovery)

Sample ID	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene
Spike (soil)	75	76	76	77	75
Spike (water)	82	75	90	83	96

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Table QA4: Trip Blank Results - Soils (mg/kg)

Sample ID	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene
Blank (soil)	<0.2	<0.5	<1	<1	<2
Blank (water) µg/L	<1	<1	<1	<1	<2

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Table QA5: Rinsate Results - Groundwater Sampling

Sample		PQL	Rinsate
TRH C6 - C9	µg/L	10	<10
TRH C6 - C10	µg/L	10	<10
TRH C6 - C10 lessBTEX (F1)	µg/L	10	<10
Benzene	µg/L	1	<1
Toluene	µg/L	1	<1
Ethylbenzene	µg/L	1	<1
m+p-xylene	µg/L	2	<2
o-xylene	µg/L	1	<1
Naphthalene	µg/L	1	<1
TRH C10 - C14	µg/L	50	<50
TRH C15 - C28	µg/L	100	<100
TRH C29 - C36	µg/L	100	<100
Total +ve TRH (C10-C36)	µg/L	50	<50
TRH >C10 - C16	µg/L	50	<50
TRH >C10 - C16less Naphthalene (F2)	µg/L	50	<50
TRH >C16 - C34	µg/L	100	<100
TRH >C34 - C40	µg/L	100	<100
Total +ve TRH (>C10-C40)	µg/L	50	<50
Naphthalene	µg/L	0.2	<0.2
Acenaphthylene	µg/L	0.1	<0.1
Acenaphthene	µg/L	0.1	<0.1
Fluorene	µg/L	0.1	<0.1
Phenanthrene	µg/L	0.1	<0.1
Anthracene	µg/L	0.1	<0.1
Fluoranthene	µg/L	0.1	<0.1
Pyrene	µg/L	0.1	<0.1
Benzo(a)anthracene	µg/L	0.1	<0.1
Chrysene	µg/L	0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	0.2	<0.2
Benzo(a)pyrene	µg/L	0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	0.1	<0.1
Benzo(g,h,i)perylene	µg/L	0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	0.5	<0.5
Arsenic-Dissolved	µg/L	1	<1
Cadmium-Dissolved	µg/L	0.1	<0.1
Chromium-Dissolved	µg/L	1	<1
Copper-Dissolved	µg/L	1	<1
Lead-Dissolved	µg/L	1	<1
Mercury-Dissolved	µg/L	0.05	<0.05
Nickel-Dissolved	µg/L	1	<1
Zinc-Dissolved	µg/L	1	1