Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on

Preliminary Site Investigation with Limited Sampling

Proposed Townhouse Development
10-12 Boondah Road, Warriewood

Prepared for
Henroth Investments Pty Ltd

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Executive Summary

Douglas Partners Pty Ltd (DP) was engaged by Henroth Investments Pty Ltd to complete this Preliminary Site Investigation with Limited Sampling (PSI) for a proposed townhouse development at 10-12 Boondah Road, Warriewood (the site).

The objective of the investigation was to assess the suitability of the site for the proposed development and whether further investigation and / or management is required. It is understood that the report will be used to support a rezoning application for the proposed development.

It is understood that the proposed development will comprise 42 townhouses with private gardens, new internal roadways with on grade parking, a children's playground and a riparian corridor.

The investigation included the review of a previous preliminary site investigation and intrusive investigation and laboratory testing at 15 locations. The site history indicated that the site was formerly a market garden / orchard prior to its current land use. Off-site sources of contamination were also identified including a sewage treatment plant and legacy landfills.

Based on the site walkover and observed features the main areas of environmental concern included imported fill, soil stockpiles, hazardous building materials from current and former buildings at the site, a number of abandoned vehicles and household refuse and a areas used to commercially cut and store firewood.

The analytical results for in all samples were below the SAC with the exception of:

- Various TPH fractions and naphthalene at TP09/0-0.1 which exceeded a number of the adopted SAC;
- A TPH (F3 >C16-C34) concentration of 880 mg/kg was detected at TP09/0.4-0.5 which exceeded the adopted EIL (300 mg/kg);
- A TPH (F3 >C16-C34) concentration of 1100 mg/kg) was detected at TP10/0-0.1which exceeded the adopted EIL (300 mg/kg); and
- Asbestos was detected in sample BH04/0-0.1 (500 ml sample) with the AF / FA concentration of 0.0015% which exceeds the adopted HIL of 0.001%. In addition, asbestos was also detected in sample TP15/0-0.1, however the AF / FA concentration was <0.001%. Also, during the site inspection in 2019 suspected ACM was observed at the surface near TP07 as noted on Drawing 1. Moreover, the site history and site conditions suggest that asbestos may be more widespread and accordingly a detailed asbestos assessment is recommended once the site is cleared of vegetation, buildings and waste materials.

The fill materials are provisionally waste classified as follows:

- Fill in the vicinity of TP09 is provisionally classified as Restricted Solid Waste;
- Fill in the vicinity of BH04, TP07 and TP15 is provisionally classified as Special Waste (asbestos) and General Solid Waste; and
- Fill at the remainder of the site is provisionally classified as General Solid Waste.

Acid sulfate soil investigations and more detailed site investigations are considered necessary to confirm the waste classification and disposal requirements of both the fill and natural soils.

Based on the findings of the previous and current investigation it is recommended that the following be undertaken:

- The site should be cleared of overgrowth, and the abandoned vehicles and general refuse removed to a facility legally able to accept these wastes;
- A hazardous building materials inspection is undertaken of the existing structures on the site. Once the structures are removed a site clearance inspection by an occupation hygienist is also recommended, including a detailed site walkover and visual inspection to assess the potential for asbestos debris contamination of the site surface;
- Further investigations into the nature of the legacy landfills at Boondah Reserve is recommended. If putrescible waste was disposed in these locations a preliminary landfill gas assessment may be recommended as part of the detailed contamination assessment;
- In addition, a detailed site investigation (DSI) is recommended and should include both asbestos assessment and groundwater investigation. The investigation should include an intrusive acid sulfate soil assessment and supplementary waste classification. as well as delineation testing of the identified asbestos impacts at BH04, TP07 and TP15 and TPH impacts TP09 and TP10, and soil stockpile testing to determine their suitability to be reused on site or otherwise disposed off-site; and
- Preparation of a remediation action plan (RAP) to address the identified TPH and asbestos contamination and any additional contamination identified during the above additional investigations.

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

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1. Introduction

Douglas Partners Pty Ltd (DP) was engaged by Henroth Investments Pty Ltd to complete this Preliminary Site Investigation with Limited Sampling (DSI) for a proposed townhouse development at 10-12 Boondah Road, Warriewood (the site). The site is shown on Drawing 1, Appendix A.

The investigation was undertaken in accordance with DP's proposal 85749.02.P.001.Rev1 dated 11 March 2022.

The objective of the investigation was to assess the suitability of the site for the proposed development and whether further investigation and/or management is required. It is understood that the report will be used to support a rezoning application for the proposed development.

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).

DP has previously prepared a preliminary site investigation entitled 'Report on Preliminary Site Investigation (for Contamination), Proposed Apartments and Playing Fields. 10-12 Boondah Road and 6 Jacksons Road, Warriewood, December 2019 (DP, 2019) and provided factual results on groundwater levels in a series of memoranda, (DP, 2016).

2. Proposed Development

It is understood that the proposed development will comprise 42 townhouses with private gardens, new internal roadways with on grade parking, a children's playground and a riparian corridor. The concept plan is presented in Drawing Buchan 220158 provided in Appendix A.

3. Scope of Work

The scope of work included:

- A review of the previous investigation report;
- Collection of soil samples from 15 test locations using a combination of excavator dug test pits and hand augured boreholes;
- Collection of soil samples at regular depth intervals and upon signs of contamination;
- Screening for volatile contaminants using a photo-ionisation detection (PID) instrument;
- Analysis of selected soil samples at a NATA accredited analytical laboratory for the following:
  - Priority metals and metalloids (As, Cd, Cr, Cu, Pb, Mn, Hg, Ni, Zn);
  - Total recoverable hydrocarbons (TRH);
  - Monocyclic aromatic hydrocarbons (benzene, toluene, ethylbenzene and xylene - BTEX);
  - Polycyclic aromatic hydrocarbons (PAH);
  - Phenols;
  - Polychlorinated biphenyls (PCB);
  - Organochlorine pesticides (OCP);
  - Nitrate and phosphate;
  - Herbicides;
  - Asbestos (in 40g soil samples);
  - Asbestos (in 500 ml samples);
  - Cation exchange capacity (CEC) and pH testing to determine ecological investigation levels;
  - Toxicity characteristic leaching procedure (TCLP) for heavy metals for waste classification purposes; and
  - Quality assurance / quality control (QA / QC) sample: replicates, trip spike and trip blank samples.
- Preparation of PSI with limited sampling report.

4. Site Information

Site Address	10-12 Boondah Road, Warriewood
Legal Description	Lot 4, DP 26902 Lot 9, DP 806132
Area	20,500 m^2
Zoning	RU2 Rural Landscape
Local Council Area	Northern Beaches Council
Current Use	Rural Residential and commercial

Surrounding Uses	North - residential (apartments) East - Boondah Road and Sewerage treatment plant South - Rural residential and Warriewood Shopping Centre West - Warriewood Wetlands

A detailed site description is provided in Section 6 which notes the site observations during the previous investigation (DP 2019) and changes to the site condition (where observed) at the time of the current investigation.

The site boundary is shown on Figure 1.

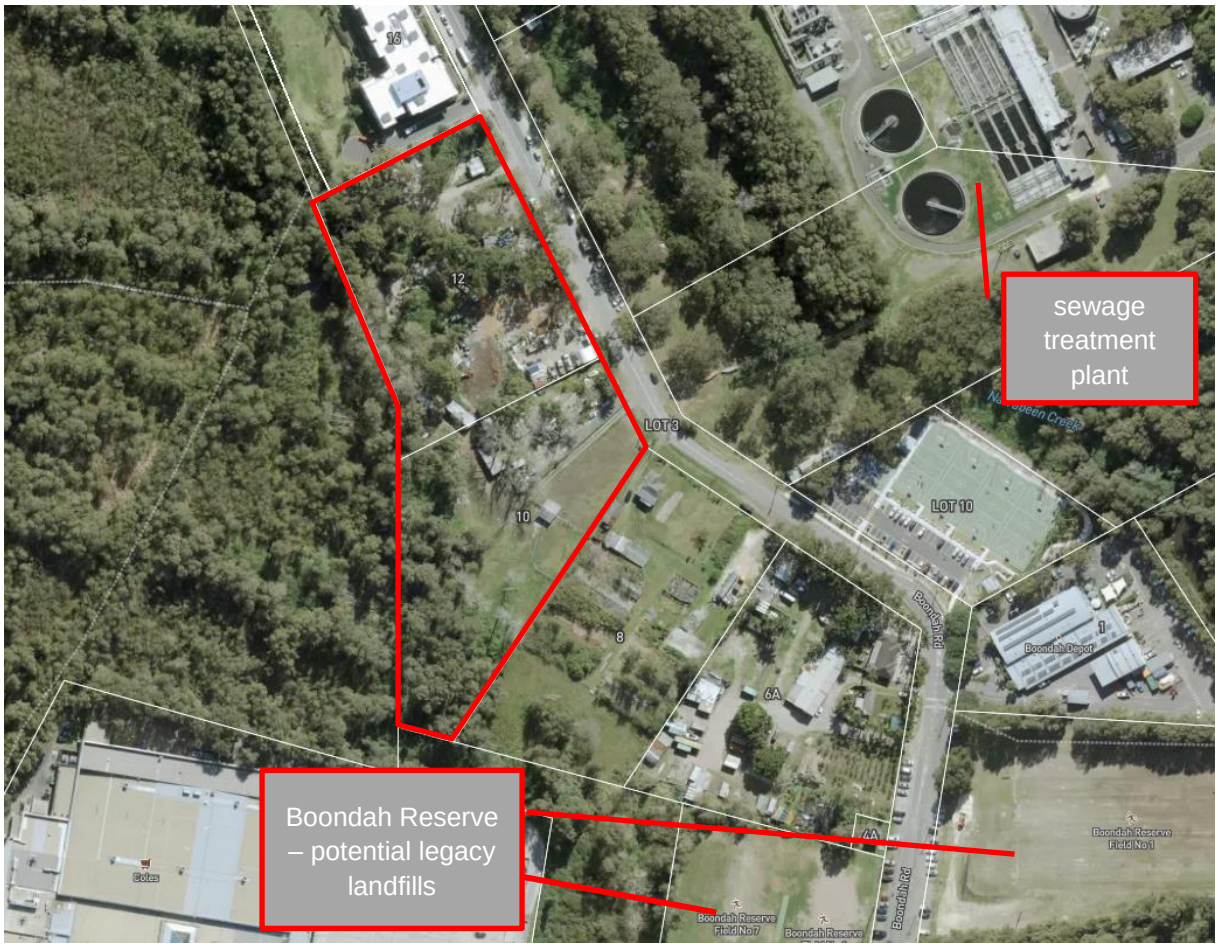


Figure 1: Site Location

5. Environmental Setting

5.1 Topography

The site is relatively flat with a surface level of approximately RL 2-4 m relative to Australian Height Datum (AHD). The site generally slopes towards the south (Narrabeen Creek) and east (Warriewood Wetland). Local relief can vary and in places the site slopes towards Boondah Road to the east.

5.2 Site Geology and Soils

Reference to the 1:100 000 Geological Series Map for Sydney indicates that the site is underlain by Quaternary alluvial and estuarine sediment comprising peaty quartz sand, silt, and clay. The geological map information was confirmed by the (DP 2016) which identified deep sands interbedded with clay bands and underlain by bedrock at approximately 20 m to 35 m depth.

DP prepared a preliminary geotechnical memorandum for the site dated 14 December 2016 based on desktop assessment and the groundwater measurement assessment referenced in Section 5.3. Based on the inspection of the site and from DP's general understanding of the local geological conditions it was anticipated that the geotechnical model for the site may include;

- Filling to depths of 1-2 m; over
- Very loose to loose sand with clayey bands to depths of 4-8 m; over
- Soft to stiff clay to depths of 10-15 m; over
- Dense to very dense sand to depths of 15-20 m; over
- Bedrock at depths of about 20-35 m; and
- A shallow groundwater table at depths of about 1-1.5 m (RL0.7 m to RL1.1 m) over most of the site and rising slightly to about RL1.5 m on the slightly elevated northern end of the site. Groundwater levels will fluctuate and may temporarily rise by at least 1 m (or higher and up to flood levels) following prolonged rainfall. Further monitoring would be required to assess fluctuations in groundwater levels.

The acid sulfate soil risk map indicates that the site is Class 3 acid sulfate soil, i.e., that there is a high probability of containing acid sulphate soils (ASS) between 1-3 m depth.

The Atlas of Australian Acid Sulfate Soils and Salinity identifies the site as being in an area categorised as Ae(p-), acid sulfate soils may be present in floodplains.

The Sydney 1:100,000 Soils Landscape Sheet indicates that the site is underlain by disturbed terrain. Disturbed terrain is described as level plain to hummocky terrain, extensively disturbed by human activity, including complete disturbance, removal or burial of soil. Land fill includes soil, rock, building and waste materials. Turfed fill areas commonly capped with up to 40 cm of sandy loam or up to 60 cm of compacted clay over fill or waste materials.

5.3 Surface Water and Groundwater

DP completed a groundwater measurement investigation for Henroth reported in a series of memoranda in 2016 (DP 2016). The investigation included the drilling of four boreholes and installation of groundwater wells within the vicinity of the site (one within the site and three within a distance of approximately 500 m of the site). The measured groundwater levels varied from 0.8 m AHD to 1.4 m AHD (1.2 to 2.7 m bgl), rising to the north. The water levels were remeasured in 2019 (8 August 2019) with groundwater levels observed at a depth of 0.7 to 1.3 m AHD (1.0 to 2.9 m bgl). It was anticipated that groundwater below the site will discharge to either Narrabeen Creek 130 m to the south of the site or to Warriewood Wetlands to the west of the site. The aquifer at the site is classified as a surficial sediment aquifer (porous media - unconsolidated).

A search of the Department of Primary Industries Water registered groundwater bore database was completed for DP (2019). There are four registered bores within 100 m of the site. Within 500 m of the site there are a further 12 household and monitoring bores. The details of the bores within 100 m are summarised in Table 1. No additional registered bores were in the records as of the time of completion of this report.

Table 1: Summary of Available Information from Nearby Registered Groundwater Bores

Bore ID Authorised Purpose Completion Year Status	Location Relative to Site	Final Depth (m)	Standing Water Level
GW113171 Monitoring 2013	28 m west (Warriewood Square Shopping Centre)	4.5	1.53
GW113169 Monitoring 2013	34 m west (Warriewood Square Shopping Centre)	4.8	1.52
GW113170 Monitoring 2013	47 m west (Warriewood Square Shopping Centre)	5.5	1.2
GW110259 Recreational 2008	96 m south-west (playing field)	5	2

6. Previous Reports and Site History

DP completed a preliminary site investigation (PSI) at the site (DP (2019). The investigation included a site walkover and site history assessment. The key findings of the site history assessment included:

- The site was formerly a market garden / nursery / orchard;
- A number of small structures and greenhouses have periodically been constructed and demolished at the site; and
- Potential off-site sources of contamination were identified including the Warriewood Sewage Treatment Plant to the east of the site and potential legacy landfills at Boondah Reserve located 50 to 100 m east and south of the site.

DP conducted a Site Walkover on 10 December 2019. Based on the site walkover and the features the main areas of environmental concern were broadly categorised into the following categories:

- Raised areas that that appear to have fill;
- Stockpiles of soil that were present at the site;
- Building materials in existing structures which may have impacted surficial soils. Potential asbestos containing materials were noted on the ground surface in two locations; and
- Areas where vehicles, general refuse, (including oil drums) and building materials had been abandoned on site.; and an area which was being used to store and cut firewood (commercially).

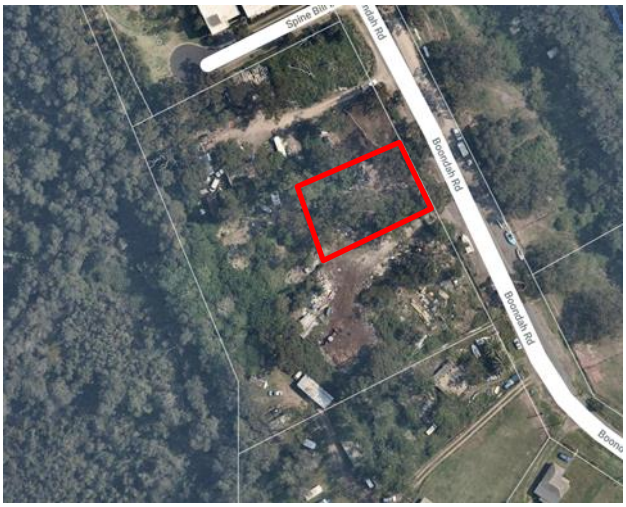
At the time of the current investigation (29 March 2022) the site had not changed substantially however some of the vehicles previously stored at the site had been removed. In addition, a portion of the site was being used as a storage yard by an electrician. It appeared that this area was primarily being used to store vehicles and temporary soil storage (a small stockpile). Access to the electrician's yard was not possible during the investigation.

The site features observed in 2019 and 2022 are noted on Drawing 1. The detailed site description is provided in Table 2.

Table 2: Site Observations

Area	Observations
North-Eastern Portion No. 10 Boondah 	The north-eastern portion of 10 Boondah Road is a residential property that is separated from the rest of 10 Boondah Road by a fence. The house at 10 Boondah appears to be constructed from timber, steel and fibro. The building was in very poor condition. The roof was weighed down by a number of tyres. At the rear to the house there was a small pile (approximately 12-15) of used tyres. The front yard of house had a lawn with parked cars and a boat that appears to be functional. A disused outhouse is present at the rear of the house which is connected to a septic system. There are several gas cylinders in this area. There are a number of motor bikes on the south-western side of the house. The bikes are in varying condition and there are a number of bike parts, oil cans and general refuse amongst the bikes. There is a corrugated iron and timber shed on the western side of the house. The shed is in poor condition and is occupied by various items including a motor bike, furniture, white goods, oxyacetylene tanks, oil drums, electrical goods and general refuse. The western portion of this section of the site is occupied by a number of abandoned vehicles including cars, vans, utes. In 2022 a number of the vehicles had been removed however a few still remained. A septic tank is present at the rear of the house.

Part No. 10 Boondah 	The majority of the southern portion of No. 10 Boondah Road and this area is occupied by horse paddock/s. The paddocks are generally covered in grass, however there are a couple of areas of exposed soil (grey brown sand). A wooden and corrugated steel structure is present in the centre of the paddock The north-western corner of No. 10 was occupied by a number of caravans in 2019 that appear to be in working order which had been removed by 2022. There is also a shipping container which is attached to a timber and steel shed. The south-western corner of No. 12 is accessed via the north-western corner of No. 10. The western fringe of the area is occupied by thick trees and shrubs bordering the Warriewood Wetlands. No significant change was noted between 2019 and 2022.
Southern Portion of 12 Boondah Road 	The south-western portion of No. 12 is slightly elevated, relative to the adjacent land (by 0.5-1.0 m) indicating that there is possible fill in this area. This area is occupied by a number of cars, caravans and sheds. The vehicles appear to be in reasonable condition. There is some general refuse in the south-west portion of the site including a few small bundles of fibre cement sheeting. The north-east corner of No. 12 is occupied by several bundles of timber, other building materials and scaffolding materials. Minor amounts of general refuse are also present in this area. No significant change was apparent in this area between 2019 and 2022.

	The central area is occupied by a large pile of freshly chopped wood, a backhoe and a work shed / shipping container. There is evidence of previous firewood stockpiling / production in this area. There were also small stockpiles of general refuse (household items and waste) in this area including discarded building materials, oil drums and other household items. A large stockpile is present in the central western portion of No. 12. The stockpile appeared to be in the order of 3 to 4 m high by 20 m x 20 m. The actual volume and composition of the stockpile was difficult to gauge due to the presence of thick vegetation covering the stockpile. The observed composition including some soil, concrete, building materials, plastic, metal, oil containers and general household refuse. No significant change was apparent in this area between 2019 and 2022.
Central, East Portion of 12 Boondah Road 	The central eastern portion of No. 12 is accessed by a separate gate. This area is occupied by two shipping containers, a small soil stockpile and general household wastes. No significant change was apparent in this area between 2019 and 2022.

South-East Portion of 12 Boondah Road 	The south-east corner of 12 Boondah Road was occupied by an electrician company in 2022. A number of commercial vehicles were present, shipping containers and a small soil stockpile which appeared to be a temporary store for soil (possibly resulting from excess materials generated from in ground works completed by the electricians on their project sites). In 2019 this area was occupied with non-commercial vehicles but otherwise did not appear to be occupied.
Northern Portion – 12 Boondah Road 	The northern portion of 12 Boondah Road is occupied by a rural residential property. The main features are described below. The site slopes up from the entrance to the rear of the site by approximately 1 m. The eastern portion of the area is occupied by a densely vegetated area on one side of the dirt drive and a horse paddock. The central northern area is used for storage of building materials and scaffolding. The western part of the area has a number of sheds, a shipping container, abandoned truck, tractor, building materials and general refuse. A small residence is present which appears to be a demountable structure attached to a gazebo and portaloo. A charcoal pit was present in this area. There is a small brick structure with an unknown function in the centre of No. 12. There is a brick outhouse in the north-eastern portion of No. 12.

It was considered that the risk of significant contamination associated with the current and historical land use is moderate. Accordingly based on the findings of the PSI, it was considered that the site can be made suitable for the proposed development subject a series of recommendations for more detailed investigations. These recommendations are provided in Section 12 with updated recommendations based on the findings of the current investigation.

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).

7.1 Potential Sources

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

S1 - Filling (applies to whole site) and demolition rubble (applies primarily to 10 and 12 Boondah Road): Associated with levelling, and site formation and demolition of previous buildings at the site.

A number of stockpiles were also noted during the site inspection. The location of the observed stockpiles and the locations where it was apparent that fill was likely (due to the ground being elevated relative to the surrounds) are noted on Drawing 1. It is noted that fill may extend beyond these areas.

COPC include metals, total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene, xylene (BTEX), polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), organochlorine pesticides (OCP), organophosphate pesticides (OPP) volatile organic compounds (VOC), phenols, asbestos and synthetic mineral fibres (SMF).

S2 - Historical market gardens (applies to the entire site).

COPC include metals, nitrates, herbicides, OCP and OPP.

S3 - Abandoned Cars, Refuse and Existing Structures.

COPC include metals, TRH, BTEX, PAH, VOC, asbestos.

The areas where significant refuse and abandoned vehicles were observed during the site inspection are noted on Drawing 1, Appendix A. It is however possible that these may extend to other areas that were not visible during the inspection due to the dense vegetation in parts of the site, or that they have moved during the course of time.

S4 - Off-site sources No. 1 - Market Gardens land use at adjacent and nearby properties (including two cement batching plants).

COPC include metals, TPH, BTEX, PAH, PCB, OCP, OPP, VOC and phenols.

S5 - Off-site sources No. 2 - Legacy Landfills and Sewage Treatment Plant

COPC include nitrates, organic acids, sulphides, landfill gas (such as methane, carbon dioxide), metals, TPH, BTEX, PAH, PCB, OCP, OPP, VOC, phenols and fluoride.

7.2 Potential Receptors

Based on the current and proposed redevelopment the following potential human health and ecological receptors have been identified.

Human Health Receptors:

R1 - Construction and maintenance workers;

R2 - Current and future users (residential and public open space); and

R3 - Adjacent users (residential, public open space, Warriewood Square Shopping Centre).

Environmental (Ecological) Receptors

R4 - Groundwater;

R5 - Surface water (Narrabeen Creek and Warriewood Wetlands); and

R6 - Terrestrial ecology.

7.3 Potential Pathways

The potential pathways for the identified receptors are as follows:

P1 - Ingestion and dermal contact;

P2 - Inhalation of dust, vapours or landfill gas (and explosive risk from landfill gas);

P3 - Leaching of contaminants and vertical mitigation into groundwater;

P4 - Lateral migration of groundwater providing baseflow to watercourses (Narrabeen Creek and Warriewood Wetland); and

P5 - Contact with terrestrial ecology.

7.4 Summary of Potential Complete Pathways

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 (complete pathways). The possible pathways between the above sources (S1 to S5) and receptors (R1 to R6) are provided in Table 2 below.

Table 2: Summary of Potential Complete Pathways

Source	Transport Pathway	Receptor	Risk Management Action Recommended
S1 Filling (applies to whole site) and demolition rubble COPC include metals, TRH, BTEX, PAH, OCP, OPP, PCB, phenols, VOC and asbestos S2 – Historical market gardens and S4 off-site Market Gardens COPC include metals, nitrates, herbicides, OCP and OPP. S3 – Abandoned Cars Refuse and existing buildings / structures (applies to 10 and 12 Boondah Road). COPC include metals, TRH, BTEX, PAH, VOC, asbestos. S5 – Off-site sources No. 2 – Legacy Landfills COPC include nitrates, organic acids, sulphides, landfill gas (methane, carbon dioxide, hydrogen sulphide), metals, TPH, BTEX, PAH, PCB, OCP,	P1: Ingestion and dermal contact P2: Inhalation of dust, vapours or landfill gas	R1: Construction and maintenance workers R2: Current and future users	A detailed site investigation for contamination is recommended to better characterise the contamination risk. Further details on the recommended investigations is provided in Section 12. Further investigation into the type and nature of the landfill present at Boondah Reserve and putrescible landfill is considered possible conduct land fill gas assessment.
	P2: Inhalation of dust, vapours or landfill gas (and potential explosive risk from landfill gas)	R3: Adjacent users	
	P3 – Leaching of contaminants and vertical mitigation into groundwater	R4 – Groundwater	
	P4 – Lateral migration of groundwater providing baseflow to watercourses Narrabeen Creek and Warriewood Wetlands)	R5 – Surface water (Narrabeen Creek and Warriewood Wetlands)	
	P5 – Contact with terrestrial ecology	R6 – Terrestrial ecology	

Source	Transport Pathway	Receptor	Risk Management Action Recommended
OPP, VOC, phenols and fluoride.			

8. Sampling and Analysis Quality Plan

8.1 Data Quality Objectives

The PSI with limited sampling 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.

Table A of NSW EPA (1995) recommends a minimum of 30 sampling points for a site of 2.0 ha for site characterisation based on the detection of circular hot spots using a systemic grid sampling pattern. Given the preliminary nature of the investigation and the limited access to parts of the site a total of 15 test locations were therefore positioned across accessible areas of the site.

A judgemental sampling strategy to determine borehole/test pit locations was adopted. Locations were based on site history information and the CSM with the rationale provided below. Borehole / test pit locations are shown on Drawing 1, in Appendix A.

Boreholes BH01 to BH03	Area currently used as a horse paddock and former market garden
Borehole BH04	Residential house
Test Pits TP05 to TP07	Suspected fill area and former vehicle storage area
Test Pit TP09 and TP10	Suspected fill area and firewood area
Test Pit TP11 to TP13	Suspected fill area, vehicle storage area, general refuse
Test Pits TP08, TP14 and 15	Site coverage

Soil samples were collected from each borehole / test pit 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.

The general 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 investigation and screening levels applied in the current investigation comprise levels adopted for a generic residential land use scenario. The derivation of the SAC is included in Appendix E and the adopted SAC are listed in Appendix E.

10. Results

10.1 Field Work Results

The borehole and test pit logs for this assessment are included in Appendix F. The logs recorded the following general sub-surface profile:

Southern Portion of 10 Boondah Road (Horse Paddock) - BH01, BH02 and BH03

Fill	Grey brown silty sand to a depth of 0.2 to 0.3 m blg
Sand:	Fine to medium grained grey sand.

Groundwater was encountered at a depth of 0.5 m to 0.8 m bgl during drilling.

Northern Side of 10 Boondah Road (Residential House) - BH04, TP05 and TP06

Fill	Dark grey clayey silt, brown sand 0.2 to 0.5 m blg. Refusal in fill encountered in BH04 at a depth of 0.3 m. Terracotta tiles noted in BH05
Sand:	Fine to medium grained grey and brown sand.

Groundwater was encountered at a depth of 0.4 m to 0.8 m bgl during test pitting in TP05 and TP06.

Deep Fill Area (Western Side of 12 Boondah Road) - TP07, TP09 to TP13

Fill	Dark grey clayey sand and brown sand with shale and sandstone, orange sand and clayey sand (crushed sandstone). Refusal in fill encountered in TP09, TP10 and TP11 at a depth of 0.2 to 0.5 m on sandstone boulders in the fill or possible concrete. Fill > 1.5 m in TP07, TP12, TP13 (limit of investigation) Terracotta fragments noted in TP07 and TP10. Firewood fragments noted in TP07.

Groundwater was encountered at a depth of 0.9 m to 1.0 m bgl during test pitting.

Eastern side of 12 Boondah Road, TP08, TP14 and TP15

Fill	Grey brown silty sand and sand to a depth of 0.1 to 0.2 m blg in TP14 and TP5. Terracotta tiles and bricks in TP08. Test pit TP08 discontinued at 0.1 m in fill due to test pit collapse (saturated soils).
Sand:	Fine to medium grained dark grey and brown sand.

Groundwater was encountered at a depth of 0.8 m bgl during test pitting at TP14 and TP15. Saturated soils in TP08 at 0.1 m (possible surface water drainage point).

It should be noted that groundwater levels are affected by climatic conditions and soil permeability and will therefore vary with time. Anecdotal information provided by the resident at the property indicated that the property periodically floods, including during the week that the investigation was undertaken with water levels in lower lying parts of the site of approximately 0.3 to 0.5 m above the surface.

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.

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

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; and
- Table G2: Summary of Waste Classification Assessment.

The laboratory certificate(s) of analysis together with the chain of custody and sample receipt information are provided in Appendix H.

11. Discussion

11.1 Soils

The analytical results for in all samples were below the SAC with the exception of:

- At TP09/0-0.1
  - o TPH (F1, C6-C10)- BTEX) was detected at a concentration of 340 mg/kg which exceeded the adopted HSL (45 mg/kg), ESL (180 mg/kg);

- TPH (F2, >C10-C16 - naphthalene) was detected at a concentration of 1200 mg/kg which exceeded the adopted HSL (110 mg/kg), ESL (120 mg/kg) and management limit (1000 mg/kg);
- TPH (F3 >C16-C34) was detected at a concentration of 17,000 mg/kg) which exceeded the adopted EIL (300 mg/kg), management limit (2500 mg/kg) and direct contact HSL (4500 mg/kg);
- A silica clean-up was undertaken on this sample to confirm the presence of petroleum hydrocarbons. The concentration of F2 (710 mg/kg) exceeded the HSL and ESL and the F3 concentration (8600 mg/kg) exceeded the EIL, management limit and direct contact HSL confirming the presence of petroleum hydrocarbons;
- Naphthalene was detected at a concentration of 5.8 mg/kg which exceeds the HIL of 3 mg/kg; and
- It is noted that shallow refusal was encountered at TP9 at 0.5 m on a possible sandstone boulder or concrete. Therefore, further investigations on the extent of the TPH impacts is recommended. Following the confirmation of the extent of TPH impacts remedial works will be required to remove or manage the associated TPH impacts.

- At TP09/0.4-0.5 TPH (F3 >C16-C34) was detected at a concentration of 880 mg/kg which exceeded the adopted EIL (300 mg/kg);
- At TP10/0-0.1 TPH (F3 >C16-C34) was detected at a concentration of 1100 mg/kg which exceeded the adopted EIL (300 mg/kg);
- Asbestos was detected in sample BH04/0-0.1 (500 ml sample) with the AF / FA concentration of 0.0015% which exceeds the adopted HIL of 0.001%. In addition, asbestos was detected in sample TP15/0-0.1, however in this case the AF / FA concentration was <0.001%. Also, during the site inspection in 2019 suspected ACM was observed at the surface near TP07 as noted on Drawing 1. Given the site history and observed site conditions it is considered quite likely that asbestos is more widespread and accordingly a detailed asbestos assessment would be warranted once the site is cleared of vegetation, buildings and surficial waste materials; and
- In addition, it is noted that herbicides, OPP and OCP were below detection limits. Furthermore, nitrate had a maximum concentration of 0.8 mg/kg and phosphate had a maximum concentration of 8.9 mg/kg indicating that significant impacts from pesticides, herbicides and fertilisers from previous market gardens and orchards is low. It is also noted that market gardening operations are understood to have ceased at the property no less than 30 years ago and therefore pesticides and herbicides would have largely been expected to have degraded (if present).

11.2 Preliminary Waste Classification

The results of the preliminary soil testing were all within the criteria for general solid waste with the following exceptions:

- TPH C10-C36 exceeded the SCC1 criteria of 10,000 mg/kg in sample TP09/0-0.1 (18,000 mg/kg) and the silica clean-up of the same sample (10,010 mg/kg); and
- Asbestos was detected in samples BH04/0-0.1 and TP15/0-0.1. Suspected ACM was also noted in 2019 on the surface near test pit TP07 (refer to Drawing 1).

It is also noted that lead exceeded the CT1 criteria in sample BH4/0-0.1 (110 mg/kg) however the TCLP result was 0.6 mg/kg and therefore the lead concentration was within the SCC1 and TCLP1 criteria for general solid waste.

Therefore, the fill is provisionally classified as follows:

- Fill in the vicinity of TP09 is provisionally classified as Restricted Solid Waste;
- Fill in the vicinity of BH04, TP07 and TP15 is provisionally classified as Special Waste (asbestos) and General Solid Waste; and
- Fill at the remainder of the site is provisionally classified as General Solid Waste.

Note: acid sulfate soil investigations and more detailed site investigations are required to confirm the classification and disposal requirements of both the fill and natural soils.

11.3 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 findings of the previous and current investigation it is recommended that the following be undertaken:

- The site should be cleared of overgrowth, and the abandoned vehicles and general refuse removed to a facility legally able to accept these wastes;
- A hazardous building materials inspection is undertaken of the existing structures on the site. Once the structures are removed a site clearance inspection by an occupation hygienist is also recommended, including a detailed site walkover and visual inspection to assess the potential for asbestos debris contamination of the site surface;
- Further investigations into the nature of the legacy landfills at Boondah Reserve is recommended. If putrescible waste was disposed in these locations a preliminary landfill gas assessment may be recommended as part of the detailed contamination assessment;
- In addition, a detailed site investigation (DSI) is recommended and should include both asbestos assessment and groundwater investigation. The investigation should include an intrusive acid sulfate soil assessment and supplementary waste classification. as well as delineation testing of the identified asbestos impacts at BH04, TP07 and TP15 and TPH impacts TP09 and TP10, and soil stockpile testing to determine their suitability to be reused on site or otherwise disposed off-site; and
- Preparation of a remediation action plan (RAP) to address the identified TPH and asbestos contamination and any additional contamination identified during the above additional investigations.

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

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. (2016). *Groundwater Measurements, Memorandums 1 to 4, 3-12 Boondah Road, Warriewood,.* Project 85749.00, 2016 to 2019: Douglas Partners Pty Ltd.

DP. (2019). *Report on Preliminary Site Investigation (for Contamination), Proposed Apartments and Playing Fields, 10-12 Boondah Road and 6 Jacksons Road Warriewood.* Project 85479.01.R.01.rev0 December 2019: Douglas Partners 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. (2020). *Guidelines for Consultants Reporting on Contaminated Land.* Contaminated Land Guidelines: NSW Environment Protection Authority.

14. Limitations

Douglas Partners (DP) has prepared this report for this project at 10-12 Boondah Road Warriewood in accordance with DP's proposal 85749.02.P.001.Rev0 dated 11 March 2022 and acceptance received from Daniel Maurici of Henroth Investments Pty Ltd. The work was carried out under DP's Conditions of Engagement. This report is provided for the exclusive use of Henroth Investments Pty Ltd 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 been detected by observation and by laboratory analysis. Building demolition materials, such as concrete and brick, were also observed and these are 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.

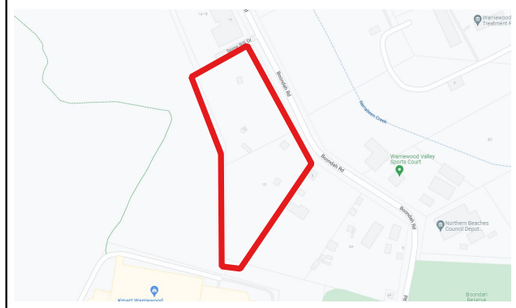
This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation,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



Notes:
1. Basemap from metromap.com (dated 20/03/2022)
2. Test locations shown are approximate only

Legend

- Site Boundary
- Test Pit Location
- Borehole Locations
- Suspected Deep Fill Zones
- ACM Observed (2019)
- Stockpiles
- Firewood Stockpile
- Abandoned Car & Refuse Zone
- Abadoned Vehicles (2019)
- Electricians Yard

4

0 10 20 30 40 m

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT:	Henroth Group		
OFFICE:	Sydney	DRAWN BY:	KDP
SCALE:	1:1437 @ A3	DATE:	29.04.2022

TITLE: **Site Location and Location of Tests**
Proposed Residential Redevelopment
10-12 Bondah Road Warriewood

N

PROJECT No:	85749.02
DRAWING No:	1
REVISION:	0

RL +4.4
RL +3.9
9000
RL +4.4
44000
RL +4.4
RL +3.9
9000
RL +4.4
44000
RL +4.4
RL +3.9
9000
RL +4.4
RL +3.9
RL +4.4
RL +2.5
25000
ramp 1:7
ramp 1:20
ramp 1:10
ramp 1:20
25000
RL +2.5
24000
ramp 1:17
24000
RL +3.9
RL +4.4
RL +2.5
6300
6000
4000
Boondah road
Pedestrian way / fire trail
Pedestrian way
Kids playground
Fire trail to RFS Spec 4 m width
TOTAL ON GRADE PARKING: 15 CAR PARK
42 townhouses @ 8.4 x 22 sqm
EEC & Reparian corridor
EEC & Reparian corridor
TN

Development Area
Setback line
Boundary line
Zoning boundary

BUCHAN

Buchan, Sydney
Preliminary

Scale 1:1000(A3)
1:500 (A1)

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
10-12 Boondah Road, Warriewood

C1.0 Data Quality Objectives

This PSI 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 rezoned for residential (townhouses). The requirements of the regulator, Northern Beaches Council, will also be considered by consulting their Development Control Plan (DCP), Local Environment Plan (LEP) and any other requirements based on our recent experience with Council on similar sites. A preliminary conceptual site model (CSM) has been prepared (Section 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. 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 were 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 exceeded the adopted criterion, a further site-specific assessment has been made as to the risk posed by the presence of that contaminant(s). Initial comparisons were with individual results then, where required, using summary statistics (including mean, standard deviation and 95% upper confidence limit (UCL) of the arithmetic mean (95% UCL)) to assess potential risks posed by the site contamination. Quality control results were 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.

C1.0 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.

Douglas Partners Pty Ltd

Appendix D

Fieldwork Methods

Appendix D
Fieldwork Methods
10-12 Boondah Road, Warriewood

1.0 Guidelines

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

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

2.0 Soil Sampling

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

- Collect soil samples directly from the excavator bucket at the nominated sample depth / hand auger;
- Transfer samples in laboratory-prepared glass jars with Teflon lined lids by hand, capping immediately and minimising headspace within the sample jar;
- Collect replicate samples in zip-lock bags for PID screening;
- Collect ~500 ml samples for FA and AF analysis;
- 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.

2.1 Field Testing

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

PID Field Test

- Calibrate the PID with isobutylene gas at 100 ppm and with fresh air prior to commencement of each successive day's field work;

- Allow the headspace in the PID zip-lock bag samples to equilibrate; and
- Screen using the PID.

3.0 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.

Douglas Partners Pty Ltd

Appendix E

Site Acceptance Criteria

Appendix E
Site Acceptance Criteria
10-12 Boondah Road, Warriewood

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).

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 are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

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

- Land use: residential (townhouses with private gardens / backyards).
  - 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.

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
Mirex	10
Toxaphene	20
OPP	
Chlorpyrifos	160
PCB	
PCB	1
Herbicides	

Contaminant	HIL-A
2,4,5-T	600
2,4-D	900
MCPA	600
MCPB	600
Mecoprop	600
Picloram	4500

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'

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 Asbestos in Soil

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

Where 500 ml soil samples were recovered The HSL for asbestos is adopted which 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 4.

Table 4: 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.

E2.3 Ecological Investigation Levels

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

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

Variable	Input	Rationale
Age of contaminants	"Aged" (>2 years)	Potential sources > 2 years old
pH	6.97	Site measured
CEC	14.2 $cmol_c/kg$	Site measured
Clay content	5%	Assumed conservative value
Traffic volumes	high	
State / Territory	NSW	

Table 6: Ecological Investigation Levels (mg/kg)

Contaminant	EIL-A-B-C
Metals	
Arsenic	100
Copper	230
Nickel	220
Chromium III	330
Lead	1100
Zinc	650
PAH	
Naphthalene	170
OCP	
DDT	180

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

E2.4 Ecological Screening Levels

Ecological screening levels (ESL) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. The adopted ESL are shown in Table 7.

Table 7: 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

E2.5 Management Limits

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

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

The adopted management limits are in Table 8.

Table 8: 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 References

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

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

Douglas Partners Pty Ltd

Appendix F

Fieldwork Results

BOREHOLE LOG

CLIENT: Henroth Investments Ltd
PROJECT: Proposed Bulky Goods Store
LOCATION: 10-12 Boondah Road, Warriewood

SURFACE LEVEL: 2.3 AHD
EASTING: 342262
NORTHING: 6270514
DIP/AZIMUTH: 90°/--

BORE No: BH01
PROJECT No: 85749.02
DATE: 29/3/2022
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: grey-brown, medium to coarse silty sand, trace roots, moist		E	0.0		PID<1		
					0.1				
	0.2	SAND: fine to medium, dark grey, moist, loose							
2					0.4				
				E			PID<1		
					0.5				
		Below 0.65m: dark grey-orange							
		Below 0.8m: saturated						▼ 29-03-22	
					0.9				
				E			PID<1		
1	1.0	Bore discontinued at 1.0m due to collapse			1.0				1
1									

RIG: Hand Auger to 1.0m **DRILLER:** VV **LOGGED:** VV **CASING:** Uncased
TYPE OF BORING: Hand Tools
WATER OBSERVATIONS: Groundwater observed at 0.8m
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: Henroth Investments Ltd
PROJECT: Proposed Bulky Goods Store
LOCATION: 10-12 Boondah Road, Warriewood

SURFACE LEVEL: 2.3 AHD
EASTING: 342244
NORTHING: 6270492
DIP/AZIMUTH: 90°/--

BORE No: BH02
PROJECT No: 85749.02
DATE: 29/3/2022
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: grey-brown, medium to coarse silty sand, trace roots, moist		E*	0.0		PID<1		
					0.1				
	0.2	SAND: fine to medium, dark grey, moist, loose							
2					0.4				
				E			PID<1		
					0.5				
		Below 0.65m: dark grey-orange							
		Below 0.8m: saturated						▼ 29-03-22	
					0.9				
				E			PID<1		
1	1.0	Bore discontinued at 1.0m Target depth reached			1.0				1
1									

RIG: Hand Auger to 1.0m **DRILLER:** VV **LOGGED:** VV **CASING:** Uncased
TYPE OF BORING: Hand Tools
WATER OBSERVATIONS: Groundwater observed at 0.8m
REMARKS: *Field Replicate BD01 taken at 0.0-0.1m

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: Henroth Investments Ltd
PROJECT: Proposed Bulky Goods Store
LOCATION: 10-12 Boondah Road, Warriewood

SURFACE LEVEL: 1.8 AHD
EASTING: 342203
NORTHING: 6270457
DIP/AZIMUTH: 90°/--

BORE No: BH03
PROJECT No: 85749.02
DATE: 29/3/2022
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: grey-brown, medium to coarse silty sand, rootlets, moist		E	0.0		PID<1		
	0.3	SAND: fine to medium, dark grey			0.1				
				E	0.4		PID<1		
	0.5	Bore discontinued at 0.5m due to collapse			0.5			29-03-22	

RIG: Hand Auger to 0.5m **DRILLER:** VV **LOGGED:** VV **CASING:** Uncased
TYPE OF BORING: Hand Tools
WATER OBSERVATIONS: Groundwater observed at 0.5m
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: Henroth Investments Ltd
PROJECT: Proposed Bulky Goods Store
LOCATION: 10-12 Boondah Road, Warriewood

SURFACE LEVEL: 2.6 AHD
EASTING: 342253
NORTHING: 6270533
DIP/AZIMUTH: 90°/--

BORE No: BH04
PROJECT No: 85749.02
DATE: 29/3/2022
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: dark grey-black, clayey silt, with roadbase gravel, moist		E	0.0 0.1		PID<1		
	0.3	Bore discontinued at 0.3m Auger Refusal in fill							

RIG: Hand Auger to 0.3m **DRILLER:** VV **LOGGED:** VV **CASING:** Uncased
TYPE OF BORING: Hand Tools
WATER OBSERVATIONS: No free groundwater observed
REMARKS:

SAMPLING & IN SITU TESTING LEGEND

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

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BOREHOLE LOG

CLIENT: Henroth Investments Ltd
PROJECT: Proposed Bulky Goods Store
LOCATION: 10-12 Boondah Road, Warriewood

SURFACE LEVEL: 4.1 AHD
EASTING: 342185
NORTHING: 6270586
DIP/AZIMUTH: 90°/--

BORE No: TP11
PROJECT No: 85749.02
DATE: 30/3/2022
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
4		FILL/SANDY Silt: dark grey, with terracotta, brick and tiles, moist		E*	0.0 0.1		PID<1		
	0.2	Bore discontinued at 0.2m Refusal on possible sandstone boulder							
3	1								1

RIG: Hand Auger to 0.2m **DRILLER:** VV **LOGGED:** VV **CASING:** Uncased
TYPE OF BORING: Hand Tools
WATER OBSERVATIONS: No free groundwater observed
REMARKS: *Field Replicate BD03 taken at 0.0-0.1m

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Henroth Investments Ltd
PROJECT: Proposed Bulky Goods Store
LOCATION: 10-12 Boondah Road, Warriewood

SURFACE LEVEL: 3.1 AHD
EASTING: 342221
NORTHING: 6270510

PIT No: TP05
PROJECT No: 85749.02
DATE: 29/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
3	0.0	FILL: dark grey-brown, sandy silt, roots and rootlets, moist		E	0.0		PID<1		5 10 15 20
	0.2	Fill: fine to medium, sand, orange-brown, trace terracotta, plastic and tiles		E	0.1				
				E	0.4		PID<1		
	0.5	SAND: fine to medium, dark grey-brown, moist			0.5				
2	1	Below 0.8m: grey-brown, saturated		E	0.9		PID<1	29-03-22	1
				E	1.0				
		Below 1.3m: pale grey		E	1.4		PID<1		
	1.5	Pit discontinued at 1.5m Target depth reached			1.5				

RIG: 3.5 T Excavator with 450mm wide bucket

LOGGED: VV

SURVEY DATUM: MGA94

WATER OBSERVATIONS: Groundwater observed at 0.8m

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Henroth Investments Ltd
PROJECT: Proposed Bulky Goods Store
LOCATION: 10-12 Boondah Road, Warriewood

SURFACE LEVEL: 2.0 AHD
EASTING: 342200
NORTHING: 6270492

PIT No: TP06
PROJECT No: 85749.02
DATE: 30/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
2		FILL: orange-brown, medium to coarse sand, roots and rootlets		E*	0.0		PID<1		5 10 15 20
					0.1				
	0.2	SAND: fine to medium, dark grey, moist							
		Below 0.4m: pale grey, saturated		E	0.4		PID<1	▼ 30-03-22	
	0.5	Pit discontinued at 0.5m Target depth reached			0.5				
1									1

RIG: 3.5 T Excavator with 450mm wide bucket

LOGGED: VV

SURVEY DATUM: MGA94

WATER OBSERVATIONS: Groundwater observed at 0.4m

REMARKS: *Field Replicate BD02 taken at 0.0-0.1m

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Henroth Investments Ltd
PROJECT: Proposed Bulky Goods Store
LOCATION: 10-12 Boondah Road, Warriewood

SURFACE LEVEL: 2.8 AHD
EASTING: 342179
NORTHING: 6270528

PIT No: TP07
PROJECT No: 85749.02
DATE: 30/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		FILL: dark grey-black, clayey silt, terracotta, roots and rootlets, trace sandstone fragments		E	0.0		PID<1		
					0.1				
	0.2	FILL/SAND: fine to medium, pale-grey, with shale gravel, moist							
				E	0.4		PID<1		
					0.5				
2		Below 0.8m: saturated							
				E	0.9		PID<1	▼ 30-03-22	
1					1.0				1
		Below 1.3m: dark grey-black, possible natural							
				E	1.4		PID<1		
	1.5	Pit discontinued at 1.5m Target depth reached			1.5				
1									

RIG: 3.5 T Excavator with 450mm wide bucket

LOGGED: VV

SURVEY DATUM: MGA94

WATER OBSERVATIONS: Groundwater observed at 0.9m

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Henroth Investments Ltd
PROJECT: Proposed Bulky Goods Store
LOCATION: 10-12 Boondah Road, Warriewood

SURFACE LEVEL: 2.8 AHD
EASTING: 342230
NORTHING: 6270580

PIT No: TP08
PROJECT No: 85749.02
DATE: 30/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		FILL/SANDY Silt: dark grey-brown, trace terracotta, brick, roots and rootlets		E	0.0		PID<1		
	0.1	Pit discontinued at 0.1m due to test pit collapse (saturated soils)			0.1				

RIG: 3.5 T Excavator with 450mm wide bucket

LOGGED: VV

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Henroth Investments Ltd
PROJECT: Proposed Bulky Goods Store
LOCATION: 10-12 Boondah Road, Warriewood

SURFACE LEVEL: 3.9 AHD
EASTING: 342200
NORTHING: 6270550

PIT No: TP09
PROJECT No: 85749.02
DATE: 30/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		FILL/SANDY Silt: dark brown and grey, with fine wood fragments and mulch		E	0.0		PID<1		
	0.2	FILL: pale grey, sand, trace wood, dry			0.1				
				E	0.4		PID<1		
	0.5	Pit discontinued at 0.5m Terminated on possible concrete or sandstone boulder			0.5				

RIG: 3.5 T Excavator with 450mm wide bucket

LOGGED: VV

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Henroth Investments Ltd
PROJECT: Proposed Bulky Goods Store
LOCATION: 10-12 Boondah Road, Warriewood

SURFACE LEVEL: 3.9 AHD
EASTING: 342200
NORTHING: 6270550

PIT No: TP09A
PROJECT No: 85749.02
DATE: 30/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		FILL/SANDY Silt: dark brown and grey, with fine wood fragments and mulch		E	0.0		PID<1		
	0.2	FILL: pale grey, sand, trace wood and concrete gravel, dry		E	0.2		PID<1		
	0.4	Pit discontinued at 0.4m Terminated on possible concrete or sandstone boulder			0.5				

RIG: 3.5 T Excavator with 450mm wide bucket

LOGGED: VV

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Henroth Investments Ltd
PROJECT: Proposed Bulky Goods Store
LOCATION: 10-12 Boondah Road, Warriewood

SURFACE LEVEL: 3.9 AHD
EASTING: 342196
NORTHING: 6270574

PIT No: TP10
PROJECT No: 85749.02
DATE: 30/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		FILL/Sandy SILT: grey-brown, root and rootlets, with wood and mulch, moist		E	0.0		PID<1		
					0.1				
	0.2	Fill: fine to medium, sand, grey and orange, trace terracotta, moist.							
				E	0.3		PID<1		
	0.4	Pit discontinued at 0.4m Refusal on possible sandstone boulder			0.4				

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

RIG: 3.5 T Excavator with 450mm wide bucket

LOGGED: VV

SURVEY DATUM: MGA94

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Henroth Investments Ltd
PROJECT: Proposed Bulky Goods Store
LOCATION: 10-12 Boondah Road, Warriewood

SURFACE LEVEL: 4.1 AHD
EASTING: 342181
NORTHING: 6270617

PIT No: TP12
PROJECT No: 85749.02
DATE: 30/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
4	0.0	FILL: medium gravel, moist		E	0.0		PID<1		
	0.1	FILL/CLAY: orange and pale grey, trace terracotta, moist			0.1				
				E	0.2		PID<1		
	0.3	FILL/SAND: fine to medium, dark grey-brown, trace terracotta			0.3				
				E	0.4		PID<1		
					0.5				
		Below 0.8m: grey-orange, possible natural							
				E	0.9				
3	1				1.0			30-03-22	1
	1.5	Pit discontinued at 1.5m Target depth reached							

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

RIG: 3.5 T Excavator with 450mm wide bucket

LOGGED: VV

SURVEY DATUM: MGA94

WATER OBSERVATIONS: Groundwater observed at 1.0m

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Henroth Investments Ltd
PROJECT: Proposed Bulky Goods Store
LOCATION: 10-12 Boondah Road, Warriewood

SURFACE LEVEL: 4.3 AHD
EASTING: 342164
NORTHING: 6270620

PIT No: TP13
PROJECT No: 85749.02
DATE: 30/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
									5 10 15 20
		FILL/SAND: medium to coarse, dark grey, roots and rootlets		E	0.0		PID<1		
					0.1				
	0.2	FILL/SAND: medium to coarse, orange-grey, with sandstone gravel, moist							
4		Below 0.4m: dark grey-brown		E	0.4		PID<1		
					0.5				
	0.8	FILL/CLAY: dark grey and orange, clayey sand, trace sandstone gravel, moist		E	0.9		PID<1		
1					1.0			▼ 30-03-22	1
3	1.4	FILL/CLAY: orange and pale grey, moist		E	1.4		PID<1		
	1.5	Pit discontinued at 1.5m Target depth reached			1.5				

RIG: 3.5 T Excavator with 450mm wide bucket

LOGGED: VV

SURVEY DATUM: MGA94

WATER OBSERVATIONS: Groundwater observed at 1.0m

REMARKS:

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

SAMPLING & IN SITU TESTING LEGEND

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

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Geotechnics / Environment / Groundwater

TEST PIT LOG

CLIENT: Henroth Investments Ltd
PROJECT: Proposed Bulky Goods Store
LOCATION: 10-12 Boondah Road, Warriewood

SURFACE LEVEL: 3.7 AHD
EASTING: 342184
NORTHING: 6270631

PIT No: TP14
PROJECT No: 85749.02
DATE: 30/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
		FILL/SAND: fine to medium, grey-brown, roots and rootlets		E*	0.0		PID<1		
					0.1				
	0.2	SAND: fine to medium, dark grey-brown, moist							
				E	0.4		PID<1		
					0.5				
		Below 0.8m: saturated						30-03-22	
				E	0.9		PID<1		
	1.0	Pit discontinued at 1.0m due to collapse in saturated soils			1.0				

RIG: 3.5 T Excavator with 450mm wide bucket

LOGGED: VV

SURVEY DATUM: MGA94

WATER OBSERVATIONS: Groundwater observed at 0.8m

REMARKS: *Field Replicate BD04 taken at 0.0-0.1m

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

SAMPLING & IN SITU TESTING LEGEND

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

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TEST PIT LOG

CLIENT: Henroth Investments Ltd
PROJECT: Proposed Bulky Goods Store
LOCATION: 10-12 Boondah Road, Warriewood

SURFACE LEVEL: 3.2 AHD
EASTING: 342208
NORTHING: 6270619

PIT No: TP15
PROJECT No: 85749.02
DATE: 30/3/2022
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing: Type	Depth	Sample	Results & Comments	Water	Dynamic Penetrometer Test (blows per mm)
3		FILL/SAND: fine to medium, dark grey-brown, moist		E*	0.0		PID<1		5 10 15 20
	0.1	SAND: fine to medium, dark grey, moist			0.1				
					0.4		PID<1		
				E					
					0.5				
		Below 0.8m: pale grey						30-03-22	
2	1.0	Pit discontinued at 1.0m due to collapse							1

RIG: 3.5 T Excavator with 450mm wide bucket

LOGGED: VV

SURVEY DATUM: MGA94

WATER OBSERVATIONS: Groundwater observed at 0.8m

REMARKS: *Field Replicate BD05 taken at 0.0-0.1m

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

SAMPLING & IN SITU TESTING LEGEND

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

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Sampling Methods

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Sampling

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

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

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

Test Pits

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

Large Diameter Augers

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

Continuous Spiral Flight Augers

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

Non-core Rotary Drilling

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

Continuous Core Drilling

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

Standard Penetration Tests

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

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

The test results are reported in the following form.

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

  4,6,7
  N=13

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

  15, 30/40 mm

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

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

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

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

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

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Introduction

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

Drilling or Excavation Methods

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

Water

▷	Water seep
▽	Water level

Sampling and Testing

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

Description of Defects in Rock

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

Defect Type

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

Orientation

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

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

Coating or Infilling Term

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

Coating Descriptor

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

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

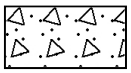
Symbols & Abbreviations

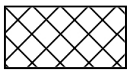
Graphic Symbols for Soil and Rock

General

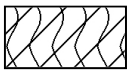

Asphalt

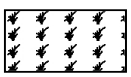

Road base

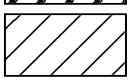

Concrete


Filling

Soils


Topsoil

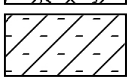

Peat


Clay


Silty clay

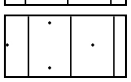

Sandy clay

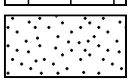

Gravelly clay

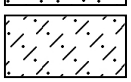

Shaly clay

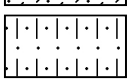

Silt


Clayey silt


Sandy silt

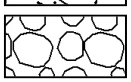

Sand


Clayey sand


Silty sand


Gravel

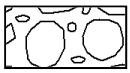

Sandy gravel


Cobbles, boulders

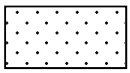

Talus

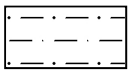
Sedimentary Rocks

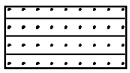

Boulder conglomerate

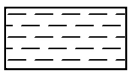

Conglomerate


Conglomeratic sandstone

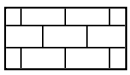

Sandstone


Siltstone

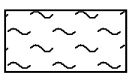

Laminite

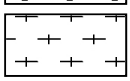

Mudstone, claystone, shale

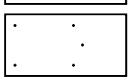

Coal


Limestone

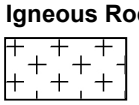
Metamorphic Rocks


Slate, phyllite, schist


Gneiss


Quartzite

Igneous Rocks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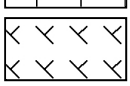
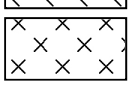
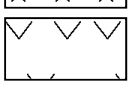
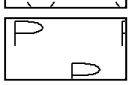

Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

Appendix G

Results Summary Tables

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Table G1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos, Asbestos, Additional chemicals

			Metals								TRH						BTEX				PAH				Phenol
			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
		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
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
BH01	0 - 0.1 m	29/03/2022	<4	<0.4	4	10	12	<0.1	2	48	<25	<50	<25	<50	100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
BH01	0.4 - 0.5 m	29/03/2022	<4	<0.4	3	4	6	<0.1	<1	12	<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 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
BH02	0 - 0.1 m	29/03/2022	<4	<0.4	2	8	13	<0.1	<1	44	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
BD01	0 m	29-Mar-22 15:00	<5	<1	3	8	16	<0.1	<2	48	<10	<50	<10	<50	<100	<100	<0.2	<0.5	<0.5	<0.5	<1	<0.5	<0.5	NT	NT
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
BH02	0.4 - 0.5 m	29/03/2022	<4	<0.4	1	5	7	<0.1	<1	17	<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 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
BH03	0 - 0.1 m	29/03/2022	<4	<0.4	<1	2	5	<0.1	<1	13	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
BH04	0 - 0.1 m	29/03/2022	<4	<0.4	9	20	110	0.1	3	69	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	0.2	<0.5	1.2	<5
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP05	0 - 0.1 m	30/03/2022	<4	<0.4	5	6	24	<0.1	1	70	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	0.09	<0.5	0.56	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP05	0.4 - 0.5 m	30/03/2022	<4	<0.4	8	8	36	<0.1	<1	47	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP06	0 - 0.1 m	30/03/2022	15	<0.4	7	7	8	<0.1	2	36	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
BD02	0 m	30/03/2022	8	<0.4	4	4	5	<0.1	1	18	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP07	0 - 0.1 m	30/03/2022	<4	<0.4	6	52	17	<0.1	7	61	<25	<50	<25	<50	180	<100	<0.2	<0.5	<1	<1	<0.1	0.56	0.7	4.2	<5
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP7	0.4 - 0.5 m	30/03/2022	<4	<0.4	3	2	4	<0.1	1	5	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	0.3	<0.5	1.7	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP07	1.4 - 1.5 m	30/03/2022	<4	<0.4	4	<1	6	<0.1	<1	1	<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 650	- -	- 120	70 180	240 -	- 300	- 2800	0.5 50	220 85	NL 70	60 105	NL 170	- 0.7	3 -	300 -	100 -
TP08	0 - 0.1 m	30/03/2022	<4	<0.4	5	12	87	<0.1	1	73	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP9	0 - 0.1 m	30/03/2022	<4	<0.4	10	6	6	<0.1	2	29	350	1200	340	1200	5600	2400	<0.2	8	<1	7	5.8	<0.05	<0.5	5.8	<5
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP09	0 - 0.1 m	silica	-	-	-	-	-	-	-	-	-	710	-	710	5600	1500	-	-	-	-	-	-	-	-	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP09	0.4 - 0.5 m	30/03/2022	<4	<0.4	7	29	39	0.2	3	51	<25	<50	<25	<50	880	270	<0.2	<0.5	<1	<1	<0.1	0.3	<0.5	2.2	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP10	0 - 0.1 m	30/03/2022	<4	<0.4	4	12	18	<0.1	2	88	<25	<50	<25	<50	1100	350	<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 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP10	0.3 - 0.4 m	30/03/2022	4	<0.4	10	10	52	<0.1	4	52	<25	<50	<25	<50	170	<100	<0.2	<0.5	<1	<1	<0.1	0.08	<0.5	0.4	<5
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP11	0 - 0.1 m	30/03/2022	4	<0.4	6	8	21	<0.1	2	47	<25	<50	<25	<50	210	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
BD03	0 m	30/03/2022	<4	<0.4	4	4	17	<0.1	1	32	<25	<50	<25	<50	160	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	NT
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP12	0 - 0.1 m	30/03/2022	<4	<0.4	13	15	10	<0.1	9	24	<25	<50	<25	<50	220	190	<0.2	<0.5	<1	<1	<0.1	0.59	0.7	4.8	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP12	0.2 - 0.3 m	30/03/2022	<4	<0.4	12	18	20	<0.1	6	26	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	0.07	<0.5	0.3	<5
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP12	0.4 - 0.5 m	30/03/2022	<4	<0.4	5	12	15	<0.1	<1	47	<25	<50	<25	<50	120	<100	<0.2	<0.5	<1	<1	<0.1	0.3	<0.5	2	-
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP13	0 - 0.1 m	30/03/2022	<4	<0.4	9	13	19	<0.1	4	92	<25	<50	<25	<50	130	<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 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP13	0.4 - 0.5 m	30/03/2022	<4	<0.4	8	11	17	<0.1	5	54	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	0.2	<0.5	1.7	<5
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP13	0.9 - 1 m	30/03/2022	<4	<0.4	5	3	6	<0.1	2	14	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP14	0 - 0.1 m	30/03/2022	<4	<0.4	8	4	12	<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
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP14	0.4 - 0.5 m	30/03/2022	<4	<0.4	<1	<1	1	<0.1	<1	12	<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 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP15	0 - 0.1 m	30/03/2022	6	<0.4	9	3	19	<0.1	<1	43	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1	<0.1	<0.05	<0.5	<0.05	<5
			100 100	20 -	100 330	6000 230	300 1100	40 -	400 220	7400 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -
TP15	0.4 - 0.5 m	30/03/2022	<4	<0.4	2	1	9	<0.1	<1	9	<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 650	- -	- 120	45 180	110 -	- 300	- 2800	0.5 50	160 85	55 70	40 105	3 170	- 0.7	3 -	300 -	100 -

Lab result

HIL/HSL value EIL/ESL value

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

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

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

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

Notes: HIL AF/FA Asbestos = 0.001 % w/w , ACM estimation = 0.01% w/w

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

b Reported naphthalene laboratory result obtained from BTEXN suite

c Criteria applies to DDT only

Site Assessment Criteria (SAC):

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

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

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

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

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

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

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

Douglas Partners
Geotechnics / Environment / Groundwater

Table G1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos, Asbestos, Additional chemicals

			OCP														OPP	nitrate	phosphate	Herbicides				
			DDD	DDT+DDE+DDD [c]	DDE	DDT	Aldrin & Dieldrin	Endosulfan I	Total Chlordane	Endosulfan II	Endosulfan Sulphate	Endrin	Total Endosulfan	Heptachlor	Hexachlorobenzene	Methoxychlor	Chlorpyriphos	nitrate	phosphate	MCPA	2-4-D	2,4,5-T	MCPB	Picloram
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.05	0.1	0.1	0.1	0.1	0.5	0.5	0.5	0.5	0.5	0.5	0.5
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
BH01	0 - 0.1 m	29/03/2022	<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	**0.6**	**6.4**	<0.5	<0.5	<0.5	<0.5	<0.5
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
BH01	0.4 - 0.5 m	29/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
BH02	0 - 0.1 m	29/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NT	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
BD01	0 m	29-Mar-22 15:00	<0.05	<0.05	<0.05	<0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2	NT	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
BH02	0.4 - 0.5 m	29/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
BH03	0 - 0.1 m	29/03/2022	<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	<0.5	**8.9**	<0.5	<0.5	<0.5	<0.5	<0.5
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
BH04	0 - 0.1 m	29/03/2022	<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	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP05	0 - 0.1 m	30/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP05	0.4 - 0.5 m	30/03/2022	<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	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP06	0 - 0.1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NT	<0.1	<0.1	<0.1	<0.1	**0.8**	**0.6**	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
BD02	0 m	30/03/2022	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP07	0 - 0.1 m	30/03/2022	<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	**0.7**	**0.5**	<0.5	<0.5	<0.5	<0.5	<0.5
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP7	0.4 - 0.5 m	30/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP07	1.4 - 1.5 m	30/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP08	0 - 0.1 m	30/03/2022	<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	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP9	0 - 0.1 m	30/03/2022	<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	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP09	0 - 0.1 m	silica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP09	0.4 - 0.5 m	30/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP10	0 - 0.1 m	30/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	**0.7**	<0.5	<0.5	<0.5	<0.5	<0.5
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP10	0.3 - 0.4 m	30/03/2022	<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	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP11	0 - 0.1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NT	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
BD03	0 m	30/03/2022	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP12	0 - 0.1 m	30/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP12	0.2 - 0.3 m	30/03/2022	<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	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP12	0.4 - 0.5 m	30/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP13	0 - 0.1 m	30/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP13	0.4 - 0.5 m	30/03/2022	<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	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP13	0.9 - 1 m	30/03/2022	<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	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP14	0 - 0.1 m	30/03/2022	<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	0.6	0.6	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP14	0.4 - 0.5 m	30/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP15	0 - 0.1 m	30/03/2022	<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	<0.5	<0.5	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -
TP15	0.4 - 0.5 m	30/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	240 180	- -	- 180	6 -	- -	50 -	- -	- -	10 -	270 -	6 -	10 -	300 -	160 -	- -	- -	600 -	900 -	600 -	600 -	4500 -

Lab result
HIL/HSL value EIL/ESL value

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

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

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

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

Notes: HIL AF/FA Asbestos = 0.001 % w/w , ACM estimation = 0.01% w/w

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

b Reported naphthalene laboratory result obtained from BTEXN suite

c Criteria applies to DDT only

Site Assessment Criteria (SAC):

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

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

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

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

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

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

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

Douglas Partners
Geotechnics / Environment / Groundwater

Table G1: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos, Asbestos, Additional chemicals

			PCB								Asbestos in 40 gram sample		Asbestos						
			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 ID in soil >0.1g/kg	Trace Analysis	Asbestos ID in soil <0.1g/kg	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	Total asbestos
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1								<0.001	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	-	-	-	-	g	g	%(w/w)	g/kg
BH01	0 - 0.1 m	29/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NAD	NAD	<0.001	NAD
BH01	0.4 - 0.5 m	29/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	0 - 0.1 m	29/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-
BD01	0 m	29-Mar-22 15:00	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-	-	-	-	-	-	-
BH02	0.4 - 0.5 m	29/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	0 - 0.1 m	29/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-
BH04	0 - 0.1 m	29/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	AD	NAD	0.0105	0.0105	NAD
TP05	0 - 0.1 m	30/03/2022	-	-	-	-	-	-	-	-	NAD	NAD	-	-	-	-	-	-	-
TP05	0.4 - 0.5 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NAD	NAD	<0.001	NAD
TP06	0 - 0.1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-
BD02	0 m	30/03/2022	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-	-	-	-	-	-	-
TP07	0 - 0.1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NAD	NAD	<0.001	NAD
TP7	0.4 - 0.5 m	30/03/2022	-	-	-	-	-	-	-	-	NAD	NAD	-	-	-	-	-	-	-
TP07	1.4 - 1.5 m	30/03/2022	-	-	-	-	-	-	-	-	NAD	NAD	-	-	-	-	-	-	-
TP08	0 - 0.1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NAD	NAD	<0.001	NAD
TP9	0 - 0.1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-
TP09	0 - 0.1 m	silica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP09	0.4 - 0.5 m	30/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NAD	NAD	<0.001	NAD
TP10	0 - 0.1 m	30/03/2022	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NAD	NAD	<0.001	NAD
TP10	0.3 - 0.4 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-
TP11	0 - 0.1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-
BD03	0 m	30/03/2022	NT	NT	NT	NT	NT	NT	NT	NT	-	-	-	-	-	-	-	-	-
TP12	0 - 0.1 m	30/03/2022	-	-	-	-	-	-	-	-	NAD	NAD	-	-	-	-	-	-	-
TP12	0.2 - 0.3 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NAD	NAD	<0.001	NAD
TP12	0.4 - 0.5 m	30/03/2022	-	-	-	-	-	-	-	-	NAD	NAD	-	-	-	-	-	-	-
TP13	0 - 0.1 m	30/03/2022	-	-	-	-	-	-	-	-	NAD	NAD	-	-	-	-	-	-	-
TP13	0.4 - 0.5 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NAD	NAD	<0.001	NAD
TP13	0.9 - 1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-
TP14	0 - 0.1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-
TP14	0.4 - 0.5 m	30/03/2022	-	-	-	-	-	-	-	-	NAD	NAD	-	-	-	-	-	-	-
TP15	0 - 0.1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	AD	NAD	0.0013	<0.001	NAD
TP15	0.4 - 0.5 m	30/03/2022	-	-	-	-	-	-	-	-	NAD	NAD	-	-	-	-	-	-	-

Lab result

HIL/HSL value EIL/ESL value

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

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

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

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

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

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

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Table G2: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos, Additional chemicals

			Metals									TRH					BTEX						PAH		Phenol	OCP	
			Arsenic	Cadmium	Total Chromium	Copper	Lead	TCLP 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	Phenol	Total Endosulfan	Total Analysed OCP
		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	5	0.05	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
BH01	0 - 0.1 m	29/03/2022	<4	<0.4	**4**	**10**	**12**	-	<0.1	**2**	**48**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	<5	-	<0.1
BH01	0.4 - 0.5 m	29/03/2022	<4	<0.4	**3**	**4**	**6**	-	<0.1	<1	**12**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	-	-	-
BH02	0 - 0.1 m	29/03/2022	<4	<0.4	**2**	**8**	**13**	-	<0.1	<1	**44**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	<5	-	<0.1
BD01	0 m	29-Mar-22 15:00	<5	<1	**3**	**8**	**16**	-	<0.1	<2	**48**	<10	<50	<100	<100	<50	<0.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	-	-	<0.05	<0.05
BH02	0.4 - 0.5 m	29/03/2022	<4	<0.4	**1**	**5**	**7**	-	<0.1	<1	**17**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	-	-	-
BH03	0 - 0.1 m	29/03/2022	<4	<0.4	**<1**	**2**	**5**	-	<0.1	<1	**13**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	<5	-	<0.1
BH04	0 - 0.1 m	29/03/2022	<4	<0.4	**9**	**20**	**110**	**0.6**	0.1	**3**	**69**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	**0.2**	**1.2**	<5	-	<0.1
TP05	0 - 0.1 m	30/03/2022	<4	<0.4	**5**	**6**	**24**	-	<0.1	**1**	**70**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	**0.09**	**0.56**	-	-	-
TP05	0.4 - 0.5 m	30/03/2022	<4	<0.4	**8**	**8**	**36**	-	<0.1	<1	**47**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	<5	-	<0.1
TP06	0 - 0.1 m	30/03/2022	**15**	<0.4	**7**	**7**	**8**	-	<0.1	**2**	**36**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	<5	-	<0.1
BD02	0 m	30/03/2022	8	<0.4	**4**	**4**	**5**	-	<0.1	**1**	**18**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	-	-	-
TP07	0 - 0.1 m	30/03/2022	<4	<0.4	**6**	**52**	**17**	-	<0.1	**7**	**61**	<25	<50	**100**	**110**	**210**	<0.2	<0.5	<1	<2	<1	<1	**0.56**	**4.2**	<5	-	<0.1
TP07	0.4 - 0.5 m	30/03/2022	<4	<0.4	**3**	**2**	**4**	-	<0.1	**1**	**5**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	**0.3**	**1.7**	-	-	-
TP07	1.4 - 1.5 m	30/03/2022	<4	<0.4	**4**	<1	**6**	-	<0.1	<1	**1**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	-	-	-
TP08	0 - 0.1 m	30/03/2022	<4	<0.4	**5**	**12**	**87**	-	<0.1	**1**	**73**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	<5	-	<0.1
TP09	0 - 0.1 m	30/03/2022	<4	<0.4	**10**	**6**	**6**	-	<0.1	**2**	**29**	**47**	**1500**	**12000**	**5300**	**18000**	<0.2	**8**	<1	**4**	**3**	**7**	<0.05	**5.8**	<5	-	<0.1
TP09	0-0.1	silica	-	-	-	-	-	-	-	-	-	-	**910**	**5400**	**3700**	**10010**	-	-	-	-	-	-	-	-	-	-	-
TP09	0.4 - 0.5 m	30/03/2022	<4	<0.4	**7**	**29**	**39**	-	0.2	**3**	**51**	<25	<50	430	**580**	**1000**	<0.2	<0.5	<1	<2	<1	<1	**0.3**	**2.2**	-	-	-
TP10	0 - 0.1 m	30/03/2022	<4	<0.4	**4**	**12**	**18**	-	<0.1	**2**	**88**	<25	<50	530	**710**	**1200**	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	-	-	-
TP10	0.3 - 0.4 m	30/03/2022	**4**	<0.4	**10**	**10**	**52**	-	<0.1	**4**	**52**	<25	<50	<100	**120**	**120**	<0.2	<0.5	<1	<2	<1	<1	**0.08**	**0.4**	<5	-	<0.1
TP11	0 - 0.1 m	30/03/2022	4	<0.4	**6**	**8**	**21**	-	<0.1	**2**	**47**	<25	<50	<100	**140**	**140**	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	<5	-	<0.1
BD03	0 m	30/03/2022	<4	<0.4	**4**	**4**	**17**	-	<0.1	**1**	**32**	<25	<50	<100	120	120	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	-	-	-
TP12	0 - 0.1 m	30/03/2022	<4	<0.4	**13**	**15**	**10**	-	<0.1	**9**	**24**	<25	<50	**110**	**170**	**280**	<0.2	<0.5	<1	<2	<1	<1	**0.59**	**4.8**	-	-	-
TP12	0.2 - 0.3 m	30/03/2022	<4	<0.4	**12**	**18**	**20**	-	<0.1	**6**	**26**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	**0.07**	**0.3**	<5	-	<0.1
TP12	0.4 - 0.5 m	30/03/2022	<4	<0.4	**5**	**12**	**15**	-	<0.1	<1	**47**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	**0.3**	**2**	-	-	-
TP13	0 - 0.1 m	30/03/2022	<4	<0.4	**9**	**13**	**19**	-	<0.1	**4**	**92**	<25	<50	<100	**120**	**120**	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	-	-	-
TP13	0.4 - 0.5 m	30/03/2022	<4	<0.4	**8**	**11**	**17**	-	<0.1	**5**	**54**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	**0.2**	**1.7**	<5	-	<0.1
TP13	0.9 - 1 m	30/03/2022	<4	<0.4	**5**	**3**	**6**	-	<0.1	**2**	**14**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	<5	-	<0.1
TP14	0 - 0.1 m	30/03/2022	<4	<0.4	**8**	**4**	**12**	-	<0.1	**3**	**24**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	<5	-	<0.1
TP14	0.4 - 0.5 m	30/03/2022	<4	<0.4	<1	<1	**1**	-	<0.1	<1	**12**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	-	-	-
TP15	0 - 0.1 m	30/03/2022	**6**	<0.4	**9**	**3**	**19**	-	<0.1	<1	**43**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	<5	-	<0.1
TP15	0.4 - 0.5 m	30/03/2022	<4	<0.4	**2**	**1**	**9**	-	<0.1	<1	**9**	<25	<50	<100	<100	<50	<0.2	<0.5	<1	<2	<1	<1	<0.05	<0.05	-	-	-
Waste Classification Criteria [f]																											
CT1			100	20	100	NC	100	N/A	4	40	NC	650	NC	NC	NC	10000	10	288	600	NC	NC	1000	0.8	200	288	60	<50
SCC1			500	100	1900	NC	1500	N/A	50	1050	NC	650	NC	NC	NC	10000	18	518	1080	NC	NC	1800	10	200	518	108	<50
TCLP1			N/A	N/A	N/A	NC	N/A	5	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	N/A	N/A	N/A
CT2			400	80	400	NC	400	N/A	16	160	NC	2600	NC	NC	NC	40000	40	1152	2400	NC	NC	4000	3.2	800	1152	240	<50
SCC2			2000	400	7600	NC	6000	N/A	200	4200	NC	2600	NC	NC	NC	40000	72	2073	4320	NC	NC	7200	23	800	2073	432	<50
TCLP2			N/A	N/A	N/A	NC	N/A	20	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	N/A	N/A	N/A

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

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Table G2: Summary of Laboratory Results – Metals, TRH, BTEX, PAH, Phenol, OCP, OPP, PCB, Asbestos, Additional chemicals

			OPP	PCB								Asbestos in 40 g sample		Asbestos in 500 ml Sample							Phenoxy Acid herbicides					Nitrate	Phosphate
			Total Analysed OPP	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	Total PCB	Asbestos ID in soil >0.1g/kg	Trace Analysis	Asbestos ID in soil >0.1g/kg	Asbestos ID in soil <0.1g/kg	Trace Analysis	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	Total Asbestos#1	2,4-D [(2,4-Dichlorophenoxy) acetic acid]	Picloram	Triclopyr	Total	phosphate	nitrate
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1								<0.001	<0.1	0.5	0.5	0.5		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	-	-	-	-	-	g	g	%(w/w)	g/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
BH01	0 - 0.1 m	29/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NAD	-	<0.001	<0.1	<0.5	<0.5	<0.5	<2	0.6	1
BH01	0.4 - 0.5 m	29/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	0 - 0.1 m	29/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
BD01	0 m	29-Mar-22 15:00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH02	0.4 - 0.5 m	29/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BH03	0 - 0.1 m	29/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<2	8.9	<0.5
BH04	0 - 0.1 m	29/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	AD	NAD	NAD	0.0105	0.0015	<0.1	-	-	-	-	-	-
TP05	0 - 0.1 m	30/03/2022	-	-	-	-	-	-	-	-	-	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
TP05	0.4 - 0.5 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NAD	-	<0.001	<0.1	-	-	-	-	-	-
TP06	0 - 0.1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	0.6	0.8
BD02	0 m	30/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07	0 - 0.1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NAD	-	<0.001	<0.1	<0.5	<0.5	<0.5	<2	0.5	0.7
TP07	0.4 - 0.5 m	30/03/2022	-	-	-	-	-	-	-	-	-	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
TP07	1.4 - 1.5 m	30/03/2022	-	-	-	-	-	-	-	-	-	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
TP08	0 - 0.1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NAD	-	<0.001	<0.1	-	-	-	-	-	-
TP09	0 - 0.1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
TP09	0-0.1	silica	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP09	0.4 - 0.5 m	30/03/2022	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NAD	-	<0.001	<0.1	-	-	-	-	-	-
TP10	0 - 0.1 m	30/03/2022	-	-	-	-	-	-	-	-	-	-	-	NAD	NAD	NAD	NAD	-	<0.001	<0.1	<0.5	<0.5	<0.5	<2	0.7	<0.5
TP10	0.3 - 0.4 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11	0 - 0.1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
BD03	0 m	30/03/2022	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP12	0 - 0.1 m	30/03/2022	-	-	-	-	-	-	-	-	-	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	<0.5	<0.5
TP12	0.2 - 0.3 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NAD	-	<0.001	<0.1	<0.5	<0.5	<0.5	<2	-	-
TP12	0.4 - 0.5 m	30/03/2022	-	-	-	-	-	-	-	-	-	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
TP13	0 - 0.1 m	30/03/2022	-	-	-	-	-	-	-	-	-	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
TP13	0.4 - 0.5 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	NAD	NAD	NAD	-	-	<0.1	-	-	-	-	-	-
TP13	0.9 - 1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14	0 - 0.1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	NAD	NAD	-	-	-	-	-	-	-	<0.5	<0.5	<0.5	<2	0.6	0.6
TP14	0.4 - 0.5 m	30/03/2022	-	-	-	-	-	-	-	-	-	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15	0 - 0.1 m	30/03/2022	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	NAD	AD	NAD	NAD	0.0013	<0.001	<0.1	-	-	-	-	<0.5	<0.5
TP15	0.4 - 0.5 m	30/03/2022	-	-	-	-	-	-	-	-	-	NAD	NAD	-	-	-	-	-	-	-	-	-	-	-	-	-
CT1			4	NC	NC	NC	NC	NC	NC	NC	<50	NC	NC	NC	NC	NC	NC	NC	NC	NC	200	60	40	NC	NC	NC
SCC1			7.5	NC	NC	NC	NC	NC	NC	NC	<50	NC	NC	NC	NC	NC	NC	NC	NC	NC	10	110	75	NC	NC	NC
TCLP1			N/A	NC	NC	NC	NC	NC	NC	NC	N/A	NC	NC	NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	NC	NC	NC
CT2			16	NC	NC	NC	NC	NC	NC	NC	<50	NC	NC	NC	NC	NC	NC	NC	NC	NC	800	240	160	NC	NC	NC
SCC2			30	NC	NC	NC	NC	NC	NC	NC	<50	NC	NC	NC	NC	NC	NC	NC	NC	NC	1440	440	300	NC	NC	NC
TCLP2			N/A	NC	NC	NC	NC	NC	NC	NC	N/A	NC	NC	NC	NC	NC	NC	NC	NC	NC	N/A	N/A	N/A	NC	NC	NC

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

Appendix H

Laboratory Certificates, Chain of Custody and Sample Receipt

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 292364

Client Details

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

Sample Details

Your Reference	**85749.02, Warriewood**
Number of Samples	32 Soil
Date samples received	31/03/2022
Date completed instructions received	31/03/2022

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	08/04/2022
Date of Issue	08/04/2022

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

Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Greta Petzold, Senior Report Coordinator
Hannah Nguyen, Metals Supervisor
Josh Williams, Organics and LC Supervisor
Liam Timmins, Chemist
Lucy Zhu, Asbestos Supervisor
Priya Samarawickrama, Senior Chemist
Thomas Beenie, Lab Technician
Thomas Lovett, Chemist

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		292364-1	292364-2	292364-3	292364-4	292364-5
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0-0.1	0.4-0.5	0-0.1	0.4-0.5	0-0.1
Date Sampled		29/03/2022	29/03/2022	29/03/2022	29/03/2022	29/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
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	%	91	89	90	83	92

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		292364-6	292364-7	292364-8	292364-9	292364-10
Your Reference	UNITS	BH4	TP5	TP5	TP6	TP7
Depth		0-0.1	0-0.1	0.4-0.5	0-0.1	0-0.1
Date Sampled		29/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
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	%	90	92	72	83	91

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		292364-11	292364-12	292364-13	292364-14	292364-15
Your Reference	UNITS	TP7	TP7	TP8	TP9	TP9
Depth		0.4-0.5	1.4-1.5	0-0.1	0-0.1	0.4-0.5
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	47	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	350	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	340	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	8	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	4	<2
o-Xylene	mg/kg	<1	<1	<1	3	<1
Naphthalene	mg/kg	<1	<1	<1	4	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	7	<1
Surrogate aaa-Trifluorotoluene	%	86	87	83	88	85

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		292364-16	292364-17	292364-18	292364-19	292364-20
Your Reference	UNITS	TP10	TP10	TP11	TP12	TP12
Depth		0-0.1	0.3-0.4	0-0.1	0-0.1	0.2-0.3
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
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	%	92	94	92	101	100

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		292364-21	292364-22	292364-23	292364-24	292364-25
Your Reference	UNITS	TP12	TP13	TP13	TP13	TP14
Depth		0.4-0.5	0-0.1	0.4-0.5	0.9-1	0-0.1
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
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	%	101	87	95	96	107

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		292364-26	292364-27	292364-28	292364-29	292364-30
Your Reference	UNITS	TP14	TP15	TP15	Spike	Blank
Depth		0.4-0.5	0-0.1	0.4-0.5	-	-
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
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	101%	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	105%	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	102%	<1
m+p-xylene	mg/kg	<2	<2	<2	100%	<2
o-Xylene	mg/kg	<1	<1	<1	103%	<1
Naphthalene	mg/kg	<1	<1	<1	[NA]	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	[NA]	<1
Surrogate aaa-Trifluorotoluene	%	89	89	97	90	109

vTRH(C6-C10)/BTEXN in Soil			
Our Reference		292364-31	292364-32
Your Reference	UNITS	BD02	BD03
Depth		-	-
Date Sampled		30/03/2022	30/03/2022
Type of sample		Soil	Soil
Date extracted	-	04/04/2022	04/04/2022
Date analysed	-	06/04/2022	06/04/2022
TRH C_6 - C_9	mg/kg	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25
Benzene	mg/kg	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1
m+p-xylene	mg/kg	<2	<2
o-Xylene	mg/kg	<1	<1
Naphthalene	mg/kg	<1	<1
Total +ve Xylenes	mg/kg	<1	<1
Surrogate aaa-Trifluorotoluene	%	96	104

svTRH (C10-C40) in Soil						
Our Reference		292364-1	292364-2	292364-3	292364-4	292364-5
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0-0.1	0.4-0.5	0-0.1	0.4-0.5	0-0.1
Date Sampled		29/03/2022	29/03/2022	29/03/2022	29/03/2022	29/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	07/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022
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	100	<50	<50	<50	<50
Surrogate o-Terphenyl	%	103	93	98	93	92

svTRH (C10-C40) in Soil						
Our Reference		292364-6	292364-7	292364-8	292364-9	292364-10
Your Reference	UNITS	BH4	TP5	TP5	TP6	TP7
Depth		0-0.1	0-0.1	0.4-0.5	0-0.1	0-0.1
Date Sampled		29/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	07/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022
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	110
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	210
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	180
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	180
Surrogate o-Terphenyl	%	97	95	93	93	101

svTRH (C10-C40) in Soil						
Our Reference		292364-11	292364-12	292364-13	292364-14	292364-15
Your Reference	UNITS	TP7	TP7	TP8	TP9	TP9
Depth		0.4-0.5	1.4-1.5	0-0.1	0-0.1	0.4-0.5
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	07/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	1,500	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	12,000	430
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	5,300	580
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	18,000	1,000
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	1,200	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	1,200	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	17,000	880
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	2,400	270
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	20,000	1,100
Surrogate o-Terphenyl	%	91	96	93	#	97

svTRH (C10-C40) in Soil						
Our Reference		292364-16	292364-17	292364-18	292364-19	292364-20
Your Reference	UNITS	TP10	TP10	TP11	TP12	TP12
Depth		0-0.1	0.3-0.4	0-0.1	0-0.1	0.2-0.3
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	07/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	530	<100	<100	110	<100
TRH C_{29} - C_{36}	mg/kg	710	120	140	170	<100
Total +ve TRH (C10-C36)	mg/kg	1,200	120	140	280	<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	1,100	170	210	220	<100
TRH >C_{34} -C_{40}	mg/kg	350	<100	<100	190	<100
Total +ve TRH (>C10-C40)	mg/kg	1,500	170	210	410	<50
Surrogate o-Terphenyl	%	104	92	91	95	91

svTRH (C10-C40) in Soil						
Our Reference		292364-21	292364-22	292364-23	292364-24	292364-25
Your Reference	UNITS	TP12	TP13	TP13	TP13	TP14
Depth		0.4-0.5	0-0.1	0.4-0.5	0.9-1	0-0.1
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	07/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022
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	120	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	120	<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	120	130	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	120	130	<50	<50	<50
Surrogate o-Terphenyl	%	92	97	88	95	91

svTRH (C10-C40) in Soil						
Our Reference		292364-26	292364-27	292364-28	292364-31	292364-32
Your Reference	UNITS	TP14	TP15	TP15	BD02	BD03
Depth		0.4-0.5	0-0.1	0.4-0.5	-	-
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	07/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022
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	120
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	120
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	160
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	160
Surrogate o-Terphenyl	%	87	90	87	88	94

PAHs in Soil						
Our Reference		292364-1	292364-2	292364-3	292364-4	292364-5
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0-0.1	0.4-0.5	0-0.1	0.4-0.5	0-0.1
Date Sampled		29/03/2022	29/03/2022	29/03/2022	29/03/2022	29/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	05/04/2022	07/04/2022	05/04/2022	07/04/2022	05/04/2022
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	%	105	101	93	99	90

PAHs in Soil						
Our Reference		292364-6	292364-7	292364-8	292364-9	292364-10
Your Reference	UNITS	BH4	TP5	TP5	TP6	TP7
Depth		0-0.1	0-0.1	0.4-0.5	0-0.1	0-0.1
Date Sampled		29/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	05/04/2022	07/04/2022	05/04/2022	05/04/2022	05/04/2022
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	0.2	0.2	<0.1	<0.1	0.4
Pyrene	mg/kg	0.2	0.2	<0.1	<0.1	0.5
Benzo(a)anthracene	mg/kg	0.2	<0.1	<0.1	<0.1	0.4
Chrysene	mg/kg	0.1	0.1	<0.1	<0.1	0.3
Benzo(b,j+k)fluoranthene	mg/kg	0.3	<0.2	<0.2	<0.2	0.9
Benzo(a)pyrene	mg/kg	0.2	0.09	<0.05	<0.05	0.56
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	0.4
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	0.5
Total +ve PAH's	mg/kg	1.2	0.56	<0.05	<0.05	4.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	0.7
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	0.8
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	0.8
Surrogate p-Terphenyl-d14	%	95	103	93	96	93

PAHs in Soil						
Our Reference		292364-11	292364-12	292364-13	292364-14	292364-15
Your Reference	UNITS	TP7	TP7	TP8	TP9	TP9
Depth		0.4-0.5	1.4-1.5	0-0.1	0-0.1	0.4-0.5
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	07/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	5.8	<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	0.3
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.1	<0.1	<0.1	<0.1	0.4
Pyrene	mg/kg	0.2	<0.1	<0.1	<0.1	0.4
Benzo(a)anthracene	mg/kg	0.1	<0.1	<0.1	<0.1	0.3
Chrysene	mg/kg	0.1	<0.1	<0.1	<0.1	0.2
Benzo(b,j+k)fluoranthene	mg/kg	0.3	<0.2	<0.2	<0.2	0.3
Benzo(a)pyrene	mg/kg	0.3	<0.05	<0.05	<0.05	0.3
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	<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	0.4	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	1.7	<0.05	<0.05	5.8	2.2
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	%	93	104	99	133	108

PAHs in Soil						
Our Reference		292364-16	292364-17	292364-18	292364-19	292364-20
Your Reference	UNITS	TP10	TP10	TP11	TP12	TP12
Depth		0-0.1	0.3-0.4	0-0.1	0-0.1	0.2-0.3
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	07/04/2022	05/04/2022	06/04/2022	07/04/2022	06/04/2022
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	0.2	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.1	<0.1	0.9	0.1
Pyrene	mg/kg	<0.1	0.1	<0.1	1	0.1
Benzo(a)anthracene	mg/kg	<0.1	0.1	<0.1	0.4	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.4	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	0.7	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.08	<0.05	0.59	0.07
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	0.2	<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	0.4	<0.1
Total +ve PAH's	mg/kg	<0.05	0.4	<0.05	4.8	0.3
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	0.7	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	0.8	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	0.8	<0.5
Surrogate p-Terphenyl-d14	%	112	98	99	100	101

PAHs in Soil						
Our Reference		292364-21	292364-22	292364-23	292364-24	292364-25
Your Reference	UNITS	TP12	TP13	TP13	TP13	TP14
Depth		0.4-0.5	0-0.1	0.4-0.5	0.9-1	0-0.1
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	07/04/2022	07/04/2022	06/04/2022	06/04/2022	06/04/2022
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	0.2	<0.1	<0.1
Pyrene	mg/kg	0.2	<0.1	0.2	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.1	<0.1	0.2	<0.1	<0.1
Chrysene	mg/kg	0.2	<0.1	0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.5	<0.2	0.3	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.3	<0.05	0.2	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	<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	0.2	<0.1	0.2	<0.1	<0.1
Total +ve PAH's	mg/kg	2.0	<0.05	1.7	<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	106	97	83	98

PAHs in Soil						
Our Reference		292364-26	292364-27	292364-28	292364-31	292364-32
Your Reference	UNITS	TP14	TP15	TP15	BD02	BD03
Depth		0.4-0.5	0-0.1	0.4-0.5	-	-
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	07/04/2022	06/04/2022	07/04/2022	07/04/2022	07/04/2022
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	103	100	98	98

Organochlorine Pesticides in soil						
Our Reference		292364-1	292364-3	292364-5	292364-6	292364-8
Your Reference	UNITS	BH1	BH2	BH3	BH4	TP5
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0.4-0.5
Date Sampled		29/03/2022	29/03/2022	29/03/2022	29/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
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	%	108	100	98	99	100

Organochlorine Pesticides in soil						
Our Reference		292364-9	292364-10	292364-13	292364-14	292364-17
Your Reference	UNITS	TP6	TP7	TP8	TP9	TP10
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0.3-0.4
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	05/04/2022	05/04/2022	07/04/2022	07/04/2022	05/04/2022
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	%	98	94	99	96	100

Organochlorine Pesticides in soil						
Our Reference		292364-18	292364-20	292364-23	292364-24	292364-25
Your Reference	UNITS	TP11	TP12	TP13	TP13	TP14
Depth		0-0.1	0.2-0.3	0.4-0.5	0.9-1	0-0.1
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
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	<0.2	<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	94	92	78	97

Organochlorine Pesticides in soil		
Our Reference		292364-27
Your Reference	UNITS	TP15
Depth		0-0.1
Date Sampled		30/03/2022
Type of sample		Soil
Date extracted	-	04/04/2022
Date analysed	-	06/04/2022
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	98

Organophosphorus Pesticides in Soil						
Our Reference		292364-1	292364-3	292364-5	292364-6	292364-8
Your Reference	UNITS	BH1	BH2	BH3	BH4	TP5
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0.4-0.5
Date Sampled		29/03/2022	29/03/2022	29/03/2022	29/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
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	%	108	100	98	99	100

Organophosphorus Pesticides in Soil						
Our Reference		292364-9	292364-10	292364-13	292364-14	292364-17
Your Reference	UNITS	TP6	TP7	TP8	TP9	TP10
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0.3-0.4
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	05/04/2022	05/04/2022	07/04/2022	07/04/2022	05/04/2022
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	%	98	94	99	96	100

Organophosphorus Pesticides in Soil						
Our Reference		292364-18	292364-20	292364-23	292364-24	292364-25
Your Reference	UNITS	TP11	TP12	TP13	TP13	TP14
Depth		0-0.1	0.2-0.3	0.4-0.5	0.9-1	0-0.1
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
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	94	92	78	97

Organophosphorus Pesticides in Soil		
Our Reference		292364-27
Your Reference	UNITS	TP15
Depth		0-0.1
Date Sampled		30/03/2022
Type of sample		Soil
Date extracted	-	04/04/2022
Date analysed	-	06/04/2022
Dichlorvos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Ethion	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Surrogate TCMX	%	98

PCBs in Soil						
Our Reference		292364-1	292364-3	292364-5	292364-6	292364-8
Your Reference	UNITS	BH1	BH2	BH3	BH4	TP5
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0.4-0.5
Date Sampled		29/03/2022	29/03/2022	29/03/2022	29/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
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	%	108	100	98	99	100

PCBs in Soil						
Our Reference		292364-9	292364-10	292364-13	292364-14	292364-17
Your Reference	UNITS	TP6	TP7	TP8	TP9	TP10
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0.3-0.4
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	05/04/2022	05/04/2022	07/04/2022	07/04/2022	05/04/2022
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	%	98	94	99	96	100

PCBs in Soil						
Our Reference		292364-18	292364-20	292364-23	292364-24	292364-25
Your Reference	UNITS	TP11	TP12	TP13	TP13	TP14
Depth		0-0.1	0.2-0.3	0.4-0.5	0.9-1	0-0.1
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
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	94	92	78	97

PCBs in Soil		
Our Reference		292364-27
Your Reference	UNITS	TP15
Depth		0-0.1
Date Sampled		30/03/2022
Type of sample		Soil
Date extracted	-	04/04/2022
Date analysed	-	06/04/2022
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate TCMX	%	98

Acid Extractable metals in soil						
Our Reference		292364-1	292364-2	292364-3	292364-4	292364-5
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0-0.1	0.4-0.5	0-0.1	0.4-0.5	0-0.1
Date Sampled		29/03/2022	29/03/2022	29/03/2022	29/03/2022	29/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	07/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	4	3	2	1	<1
Copper	mg/kg	10	4	8	5	2
Lead	mg/kg	12	6	13	7	5
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	<1	<1	<1	<1
Zinc	mg/kg	48	12	44	17	13

Acid Extractable metals in soil						
Our Reference		292364-6	292364-7	292364-8	292364-9	292364-10
Your Reference	UNITS	BH4	TP5	TP5	TP6	TP7
Depth		0-0.1	0-0.1	0.4-0.5	0-0.1	0-0.1
Date Sampled		29/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	07/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022
Arsenic	mg/kg	<4	<4	<4	15	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	9	5	8	7	6
Copper	mg/kg	20	6	8	7	52
Lead	mg/kg	110	24	36	8	17
Mercury	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	3	1	<1	2	7
Zinc	mg/kg	69	70	47	36	61

Acid Extractable metals in soil						
Our Reference		292364-11	292364-12	292364-13	292364-14	292364-15
Your Reference	UNITS	TP7	TP7	TP8	TP9	TP9
Depth		0.4-0.5	1.4-1.5	0-0.1	0-0.1	0.4-0.5
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	07/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022
Arsenic	mg/kg	<4	<4	<4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	3	4	5	10	7
Copper	mg/kg	2	<1	12	6	29
Lead	mg/kg	4	6	87	6	39
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	0.2
Nickel	mg/kg	1	<1	1	2	3
Zinc	mg/kg	5	1	73	29	51

Acid Extractable metals in soil						
Our Reference		292364-16	292364-17	292364-18	292364-19	292364-20
Your Reference	UNITS	TP10	TP10	TP11	TP12	TP12
Depth		0-0.1	0.3-0.4	0-0.1	0-0.1	0.2-0.3
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	07/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022
Arsenic	mg/kg	<4	4	4	<4	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	4	10	6	13	12
Copper	mg/kg	12	10	8	15	18
Lead	mg/kg	18	52	21	10	20
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	4	2	9	6
Zinc	mg/kg	88	52	47	24	26

Acid Extractable metals in soil						
Our Reference		292364-21	292364-22	292364-23	292364-24	292364-25
Your Reference	UNITS	TP12	TP13	TP13	TP13	TP14
Depth		0.4-0.5	0-0.1	0.4-0.5	0.9-1	0-0.1
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	07/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022
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	9	8	5	8
Copper	mg/kg	12	13	11	3	4
Lead	mg/kg	15	19	17	6	12
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	4	5	2	3
Zinc	mg/kg	47	92	54	14	24

Acid Extractable metals in soil						
Our Reference		292364-26	292364-27	292364-28	292364-31	292364-32
Your Reference	UNITS	TP14	TP15	TP15	BD02	BD03
Depth		0.4-0.5	0-0.1	0.4-0.5	-	-
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	07/04/2022	07/04/2022	07/04/2022	07/04/2022	07/04/2022
Arsenic	mg/kg	<4	6	<4	8	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	<1	9	2	4	4
Copper	mg/kg	<1	3	1	4	4
Lead	mg/kg	1	19	9	5	17
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	<1	<1	<1	1	1
Zinc	mg/kg	12	43	9	18	32

Misc Soil - Inorg						
Our Reference		292364-1	292364-3	292364-5	292364-6	292364-8
Your Reference	UNITS	BH1	BH2	BH3	BH4	TP5
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0.4-0.5
Date Sampled		29/03/2022	29/03/2022	29/03/2022	29/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Date analysed	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference		292364-9	292364-10	292364-13	292364-14	292364-17
Your Reference	UNITS	TP6	TP7	TP8	TP9	TP10
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0.3-0.4
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Date analysed	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg						
Our Reference		292364-18	292364-20	292364-23	292364-24	292364-25
Your Reference	UNITS	TP11	TP12	TP13	TP13	TP14
Depth		0-0.1	0.2-0.3	0.4-0.5	0.9-1	0-0.1
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Date analysed	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Total Phenolics (as Phenol)	mg/kg	<5	<5	<5	<5	<5

Misc Soil - Inorg		
Our Reference		292364-27
Your Reference	UNITS	TP15
Depth		0-0.1
Date Sampled		30/03/2022
Type of sample		Soil
Date prepared	-	05/04/2022
Date analysed	-	05/04/2022
Total Phenolics (as Phenol)	mg/kg	<5

Moisture						
Our Reference		292364-1	292364-2	292364-3	292364-4	292364-5
Your Reference	UNITS	BH1	BH1	BH2	BH2	BH3
Depth		0-0.1	0.4-0.5	0-0.1	0.4-0.5	0-0.1
Date Sampled		29/03/2022	29/03/2022	29/03/2022	29/03/2022	29/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Moisture	%	26	17	18	18	17

Moisture						
Our Reference		292364-6	292364-7	292364-8	292364-9	292364-10
Your Reference	UNITS	BH4	TP5	TP5	TP6	TP7
Depth		0-0.1	0-0.1	0.4-0.5	0-0.1	0-0.1
Date Sampled		29/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Moisture	%	26	21	13	16	15

Moisture						
Our Reference		292364-11	292364-12	292364-13	292364-14	292364-15
Your Reference	UNITS	TP7	TP7	TP8	TP9	TP9
Depth		0.4-0.5	1.4-1.5	0-0.1	0-0.1	0.4-0.5
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Moisture	%	12	21	17	48	20

Moisture						
Our Reference		292364-16	292364-17	292364-18	292364-19	292364-20
Your Reference	UNITS	TP10	TP10	TP11	TP12	TP12
Depth		0-0.1	0.3-0.4	0-0.1	0-0.1	0.2-0.3
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Moisture	%	43	20	16	12	14

Moisture						
Our Reference		292364-21	292364-22	292364-23	292364-24	292364-25
Your Reference	UNITS	TP12	TP13	TP13	TP13	TP14
Depth		0.4-0.5	0-0.1	0.4-0.5	0.9-1	0-0.1
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Moisture	%	16	24	10	15	19

Moisture						
Our Reference		292364-26	292364-27	292364-28	292364-31	292364-32
Your Reference	UNITS	TP14	TP15	TP15	BD02	BD03
Depth		0.4-0.5	0-0.1	0.4-0.5	-	-
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	04/04/2022	04/04/2022	04/04/2022	04/04/2022	04/04/2022
Date analysed	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Moisture	%	18	16	14	12	16

Asbestos ID - soils						
Our Reference		292364-3	292364-5	292364-7	292364-9	292364-11
Your Reference	UNITS	BH2	BH3	TP5	TP6	TP7
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0.4-0.5
Date Sampled		29/03/2022	29/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
Sample mass tested	g	Approx. 30g	Approx. 40g	Approx. 35g	Approx. 25g	Approx. 45g
Sample Description	-	Grey sandy soil & rocks	Grey sandy soil & rocks	Grey sandy soil & rocks	Brown sandy soil & rocks	Beige sandy 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		292364-12	292364-14	292364-17	292364-18	292364-19
Your Reference	UNITS	TP7	TP9	TP10	TP11	TP12
Depth		1.4-1.5	0-0.1	0.3-0.4	0-0.1	0-0.1
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
Sample mass tested	g	Approx. 20g	Approx. 5g	Approx. 45g	Approx. 45g	Approx. 50g
Sample Description	-	Grey sandy soil & rocks	Brown mulch	Grey sandy soil & rocks	Brown sandy soil & rocks	Beige 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 Synthetic mineral fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils						
Our Reference		292364-21	292364-22	292364-24	292364-25	292364-26
Your Reference	UNITS	TP12	TP13	TP13	TP14	TP14
Depth		0.4-0.5	0-0.1	0.9-1	0-0.1	0.4-0.5
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
Sample mass tested	g	Approx. 35g	Approx. 35g	Approx. 45g	Approx. 45g	Approx. 45g
Sample Description	-	Grey sandy soil & rocks	Grey sandy soil & rocks	Brown coarse-grained soil & rocks	Beige coarse-grained soil & rocks	Grey sandy 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		292364-28
Your Reference	UNITS	TP15
Depth		0.4-0.5
Date Sampled		30/03/2022
Type of sample		Soil
Date analysed	-	06/04/2022
Sample mass tested	g	Approx. 40g
Sample Description	-	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected

Asbestos ID - soils NEPM						
Our Reference		292364-1	292364-6	292364-8	292364-10	292364-13
Your Reference	UNITS	BH1	BH4	TP5	TP7	TP8
Depth		0-0.1	0-0.1	0.4-0.5	0-0.1	0-0.1
Date Sampled		29/03/2022	29/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Sample mass tested	g	653.38	704.94	1,128.82	1,035.85	1,170.45
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	Chrysotile Amosite Crocidolite	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	0.0105	–	–	–
FA and AF Estimation*#2	%(w/w)	<0.001	0.0015	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM						
Our Reference		292364-15	292364-16	292364-20	292364-23	292364-27
Your Reference	UNITS	TP9	TP10	TP12	TP13	TP15
Depth		0.4-0.5	0-0.1	0.2-0.3	0.4-0.5	0-0.1
Date Sampled		30/03/2022	30/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	05/04/2022	05/04/2022	05/04/2022	05/04/2022	05/04/2022
Sample mass tested	g	798.06	451.68	925.47	1,037.75	1,013.93
Sample Description	-	Brown coarse-grained soil & rocks	Brown fine-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos[#1]	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	Amosite
ACM >7mm Estimation*	g	–	–	–	–	–
FA and AF Estimation*	g	–	–	–	–	0.0013
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Misc Inorg - Soil						
Our Reference		292364-1	292364-5	292364-9	292364-10	292364-16
Your Reference	UNITS	BH1	BH3	TP6	TP7	TP10
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0-0.1
Date Sampled		29/03/2022	29/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
Date analysed	-	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
Nitrate as N in soil	mg/kg	1	<0.5	0.8	0.7	<0.5
Phosphate as P in soil	mg/kg	0.6	8.9	0.6	0.5	0.7
pH 1:5 soil:water	pH Units	6.4	[NA]	[NA]	7.1	[NA]

Misc Inorg - Soil				
Our Reference		292364-20	292364-25	292364-27
Your Reference	UNITS	TP12	TP14	TP15
Depth		0.2-0.3	0-0.1	0-0.1
Date Sampled		30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	06/04/2022	06/04/2022	06/04/2022
Date analysed	-	06/04/2022	06/04/2022	06/04/2022
Nitrate as N in soil	mg/kg	<0.5	0.6	<0.5
Phosphate as P in soil	mg/kg	<0.5	0.6	<0.5
pH 1:5 soil:water	pH Units	7.4	[NA]	[NA]

CEC				
Our Reference		292364-1	292364-10	292364-20
Your Reference	UNITS	BH1	TP7	TP12
Depth		0-0.1	0-0.1	0.2-0.3
Date Sampled		29/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil
Date prepared	-	08/04/2022	08/04/2022	08/04/2022
Date analysed	-	08/04/2022	08/04/2022	08/04/2022
Exchangeable Ca	meq/100g	8.2	9.4	22
Exchangeable K	meq/100g	0.4	0.2	0.3
Exchangeable Mg	meq/100g	1.1	0.8	1.1
Exchangeable Na	meq/100g	<0.1	<0.1	0.1
Cation Exchange Capacity	meq/100g	9.7	10	23

Phenoxy Acid Herbicides in Soil						
Our Reference		292364-1	292364-5	292364-10	292364-16	292364-20
Your Reference	UNITS	BH1	BH3	TP7	TP10	TP12
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0.2-0.3
Date Sampled		29/03/2022	29/03/2022	30/03/2022	30/03/2022	30/03/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
Date analysed	-	06/04/2022	06/04/2022	06/04/2022	06/04/2022	06/04/2022
Clopyralid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3,5-Dichlorobenzoic acid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
o-chlorophenoxy acetic acid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-CPA	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dicamba	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
MCPP	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
MCPA	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorprop	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-D	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoxynil	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Triclopyr	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-TP	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-T	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
MCPB	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dinoseb	mg/kg	<1	<1	<1	<1	<1
2,4-DB	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ioxynil	mg/kg	<1	<1	<1	<1	<1
Picloram	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
DCPA (Chlorthal) Diacid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acifluorfen	mg/kg	<2	<2	<2	<2	<2
2,4,6-T	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-D	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate 2.4- DCPA	%	100	100	100	110	110

Phenoxy Acid Herbicides in Soil		
Our Reference		292364-25
Your Reference	UNITS	TP14
Depth		0-0.1
Date Sampled		30/03/2022
Type of sample		Soil
Date extracted	-	06/04/2022
Date analysed	-	06/04/2022
Clopyralid	mg/kg	<0.5
3,5-Dichlorobenzoic acid	mg/kg	<0.5
o-chlorophenoxy acetic acid	mg/kg	<0.5
4-CPA	mg/kg	<0.5
Dicamba	mg/kg	<0.5
MCPP	mg/kg	<0.5
MCPA	mg/kg	<0.5
Dichlorprop	mg/kg	<0.5
2,4-D	mg/kg	<0.5
Bromoxynil	mg/kg	<0.5
Triclopyr	mg/kg	<0.5
2,4,5-TP	mg/kg	<0.5
2,4,5-T	mg/kg	<0.5
MCPB	mg/kg	<0.5
Dinoseb	mg/kg	<1
2,4-DB	mg/kg	<0.5
Ioxynil	mg/kg	<1
Picloram	mg/kg	<0.5
DCPA (Chlorthal) Diacid	mg/kg	<0.5
Acifluorfen	mg/kg	<2
2,4,6-T	mg/kg	<0.5
2,6-D	mg/kg	<0.5
Surrogate 2.4- DCPA	%	110

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. **NOTE** #1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF) **NOTE** #2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "--" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Ext-054	Analysed by MPL Envirolab
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-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
Inorg-055	Nitrate - determined colourimetrically. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Inorg-060	Phosphate determined colourimetrically based on EPA365.1 and APHA latest edition 4500 P E. Waters samples are filtered on receipt prior to analysis. Soils are analysed following a water extraction.
Metals-020	Determination of various metals by ICP-AES.
Metals-020	Determination of exchangeable cations and cation exchange capacity in soils using 1M Ammonium Chloride exchange and ICP-OES analytical finish.
Metals-021	Determination of Mercury by Cold Vapour AAS.

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
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.

Method ID	Methodology Summary
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	292364-3
Date extracted	-			04/04/2022	1	04/04/2022	04/04/2022		04/04/2022	04/04/2022
Date analysed	-			06/04/2022	1	06/04/2022	06/04/2022		06/04/2022	06/04/2022
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	102	89
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	102	89
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	104	96
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	112	92
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	93	82
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	101	88
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	83	71
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	97	1	91	89	2	96	86

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	292364-22
Date extracted	-			[NT]	10	04/04/2022	04/04/2022		04/04/2022	04/04/2022
Date analysed	-			[NT]	10	06/04/2022	06/04/2022		06/04/2022	06/04/2022
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	10	<25	<25	0	104	92
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	10	<25	<25	0	104	92
Benzene	mg/kg	0.2	Org-023	[NT]	10	<0.2	<0.2	0	115	96
Toluene	mg/kg	0.5	Org-023	[NT]	10	<0.5	<0.5	0	109	92
Ethylbenzene	mg/kg	1	Org-023	[NT]	10	<1	<1	0	94	89
m+p-xylene	mg/kg	2	Org-023	[NT]	10	<2	<2	0	101	91
o-Xylene	mg/kg	1	Org-023	[NT]	10	<1	<1	0	83	75
Naphthalene	mg/kg	1	Org-023	[NT]	10	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	10	91	98	7	101	92

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	04/04/2022	04/04/2022		[NT]	[NT]
Date analysed	-			[NT]	21	06/04/2022	06/04/2022		[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	101	94	7	[NT]	[NT]

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]	31	04/04/2022	04/04/2022		[NT]	[NT]
Date analysed	-			[NT]	31	06/04/2022	06/04/2022		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-023	[NT]	31	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-023	[NT]	31	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	31	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	31	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	31	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	31	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	31	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	31	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	31	96	93	3	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	292364-3
Date extracted	-			04/04/2022	1	04/04/2022	04/04/2022		04/04/2022	04/04/2022
Date analysed	-			07/04/2022	1	07/04/2022	07/04/2022		07/04/2022	07/04/2022
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	97	96
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	98	104
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	121	115
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	97	96
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	100	130	26	98	104
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	121	115
Surrogate o-Terphenyl	%		Org-020	102	1	103	103	0	104	98

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	292364-22
Date extracted	-			[NT]	10	04/04/2022	04/04/2022		04/04/2022	04/04/2022
Date analysed	-			[NT]	10	07/04/2022	07/04/2022		07/04/2022	07/04/2022
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	10	<50	<50	0	69	89
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	10	100	<100	0	60	100
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	10	110	<100	10	103	#
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	10	<50	<50	0	70	89
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	10	180	100	57	60	100
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	10	<100	<100	0	103	#
Surrogate o-Terphenyl	%		Org-020	[NT]	10	101	96	5	87	97

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	04/04/2022	04/04/2022		[NT]	[NT]
Date analysed	-			[NT]	21	07/04/2022	07/04/2022		[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	120	<100	18	[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	92	90	2	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	31	04/04/2022	04/04/2022		[NT]	[NT]
Date analysed	-			[NT]	31	07/04/2022	07/04/2022		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-020	[NT]	31	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-020	[NT]	31	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-020	[NT]	31	<100	<100	0	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	[NT]	31	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	[NT]	31	<100	<100	0	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	[NT]	31	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	31	88	86	2	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	292364-3
Date extracted	-			04/04/2022	1	04/04/2022	04/04/2022		04/04/2022	04/04/2022
Date analysed	-			05/04/2022	1	05/04/2022	05/04/2022		05/04/2022	05/04/2022
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	99	92
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	89
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	103
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	106	94
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	98	96
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	101	101
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	95	91
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	110	106
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	101	1	105	99	6	99	86

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	292364-22
Date extracted	-			[NT]	10	04/04/2022	04/04/2022		04/04/2022	04/04/2022
Date analysed	-			[NT]	10	05/04/2022	05/04/2022		05/04/2022	07/04/2022
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	92	101
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	91	95
Fluorene	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	105	101
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	10	0.1	<0.1	0	98	104
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	0.4	0.3	29	98	102
Pyrene	mg/kg	0.1	Org-022/025	[NT]	10	0.5	0.4	22	103	109
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	10	0.4	0.3	29	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	10	0.3	0.2	40	89	93
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	10	0.9	0.6	40	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	10	0.56	0.4	33	106	134
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	10	0.4	0.2	67	[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	0.5	0.3	50	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	10	93	86	8	90	101

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			[NT]	21	04/04/2022	04/04/2022		04/04/2022	[NT]
Date analysed	-			[NT]	21	07/04/2022	07/04/2022		07/04/2022	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	99	[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	97	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	97	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	21	<0.1	<0.1	0	106	[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	98	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	21	0.2	0.1	67	101	[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	0.2	<0.1	67	95	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	21	0.5	0.3	50	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	21	0.3	0.2	40	110	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	21	0.2	<0.1	67	[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	0.2	0.1	67	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	21	100	101	1	99	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	31	04/04/2022	04/04/2022		[NT]	[NT]
Date analysed	-			[NT]	31	07/04/2022	07/04/2022		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	31	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	31	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	31	98	97	1	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	292364-3
Date extracted	-			07/04/2022	1	04/04/2022	04/04/2022		07/04/2022	04/04/2022
Date analysed	-			07/04/2022	1	05/04/2022	05/04/2022		07/04/2022	05/04/2022
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	90
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	131	92
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	93	85
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	87	97
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	100	96
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	101	95
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	104	98
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	100
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	90	102
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	84
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	86	1	108	101	7	88	93

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			[NT]	10	04/04/2022	04/04/2022		04/04/2022	[NT]
Date analysed	-			[NT]	10	05/04/2022	05/04/2022		07/04/2022	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	92	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	96	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	107	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	105	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	106	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	96	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	90	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	92	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	110	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	104	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	10	94	90	4	85	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	23	04/04/2022	04/04/2022		[NT]	[NT]
Date analysed	-			[NT]	23	06/04/2022	06/04/2022		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	23	<0.2	<0.2	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	23	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	23	92	76	19	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	292364-3
Date extracted	-			04/04/2022	1	04/04/2022	04/04/2022		04/04/2022	04/04/2022
Date analysed	-			05/04/2022	1	05/04/2022	05/04/2022		05/04/2022	05/04/2022
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	106	120
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	93	91
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	130	132
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	114	122
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	104
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	115	121
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	115	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	87	1	108	101	7	94	93

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			[NT]	10	04/04/2022	04/04/2022		04/04/2022	[NT]
Date analysed	-			[NT]	10	05/04/2022	05/04/2022		07/04/2022	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	112	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	101	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	121	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	122	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	116	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	105	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	129	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	10	94	90	4	85	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	292364-3
Date extracted	-			07/04/2022	1	04/04/2022	04/04/2022		07/04/2022	04/04/2022
Date analysed	-			07/04/2022	1	05/04/2022	05/04/2022		07/04/2022	05/04/2022
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	98	100
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	86	1	108	101	7	88	93

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	[NT]
Date extracted	-			[NT]	10	04/04/2022	04/04/2022		04/04/2022	[NT]
Date analysed	-			[NT]	10	05/04/2022	05/04/2022		07/04/2022	[NT]
Aroclor 1016	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	101	[NT]
Aroclor 1260	mg/kg	0.1	Org-021	[NT]	10	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	[NT]	10	94	90	4	85	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	292364-3
Date prepared	-			04/04/2022	1	04/04/2022	04/04/2022		04/04/2022	04/04/2022
Date analysed	-			07/04/2022	1	07/04/2022	07/04/2022		07/04/2022	07/04/2022
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	99	96
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	101	91
Chromium	mg/kg	1	Metals-020	<1	1	4	4	0	98	92
Copper	mg/kg	1	Metals-020	<1	1	10	10	0	92	92
Lead	mg/kg	1	Metals-020	<1	1	12	14	15	98	91
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	120	115
Nickel	mg/kg	1	Metals-020	<1	1	2	2	0	97	91
Zinc	mg/kg	1	Metals-020	<1	1	48	48	0	99	89

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-6	292364-22
Date prepared	-			[NT]	10	04/04/2022	04/04/2022		04/04/2022	04/04/2022
Date analysed	-			[NT]	10	07/04/2022	07/04/2022		07/04/2022	07/04/2022
Arsenic	mg/kg	4	Metals-020	[NT]	10	<4	<4	0	97	100
Cadmium	mg/kg	0.4	Metals-020	[NT]	10	<0.4	<0.4	0	98	93
Chromium	mg/kg	1	Metals-020	[NT]	10	6	5	18	95	88
Copper	mg/kg	1	Metals-020	[NT]	10	52	57	9	90	92
Lead	mg/kg	1	Metals-020	[NT]	10	17	19	11	95	93
Mercury	mg/kg	0.1	Metals-021	[NT]	10	<0.1	<0.1	0	126	121
Nickel	mg/kg	1	Metals-020	[NT]	10	7	3	80	94	90
Zinc	mg/kg	1	Metals-020	[NT]	10	61	64	5	96	84

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	04/04/2022	04/04/2022		[NT]	[NT]
Date analysed	-			[NT]	21	07/04/2022	07/04/2022		[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	5	5	0	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	21	12	14	15	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	21	15	19	24	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	21	<0.1	0.2	67	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	21	<1	<1	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	21	47	55	16	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	31	04/04/2022	04/04/2022		[NT]	[NT]
Date analysed	-			[NT]	31	07/04/2022	07/04/2022		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	31	8	8	0	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	31	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	31	4	4	0	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	31	4	4	0	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	31	5	5	0	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	31	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	31	1	1	0	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	31	18	17	6	[NT]	[NT]

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	292364-3
Date prepared	-			05/04/2022	1	05/04/2022	05/04/2022		05/04/2022	05/04/2022
Date analysed	-			05/04/2022	1	05/04/2022	05/04/2022		05/04/2022	05/04/2022
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	<5	1	<5	<5	0	102	96

QUALITY CONTROL: Misc Soil - Inorg						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	10	05/04/2022	05/04/2022		[NT]	[NT]
Date analysed	-			[NT]	10	05/04/2022	05/04/2022		[NT]	[NT]
Total Phenolics (as Phenol)	mg/kg	5	Inorg-031	[NT]	10	<5	<5	0	[NT]	[NT]

QUALITY CONTROL: Misc Inorg - Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date prepared	-			06/04/2022	[NT]	[NT]	[NT]	[NT]	06/04/2022	[NT]
Date analysed	-			06/04/2022	[NT]	[NT]	[NT]	[NT]	06/04/2022	[NT]
Nitrate as N in soil	mg/kg	0.5	Inorg-055	<0.5	[NT]	[NT]	[NT]	[NT]	105	[NT]
Phosphate as P in soil	mg/kg	0.5	Inorg-060	<0.5	[NT]	[NT]	[NT]	[NT]	102	[NT]
pH 1:5 soil:water	pH Units		Inorg-001	[NT]	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: CEC						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			08/04/2022	20	08/04/2022	08/04/2022		08/04/2022	[NT]
Date analysed	-			08/04/2022	20	08/04/2022	08/04/2022		08/04/2022	[NT]
Exchangeable Ca	meq/100g	0.1	Metals-020	<0.1	20	22	17	26	115	[NT]
Exchangeable K	meq/100g	0.1	Metals-020	<0.1	20	0.3	0.3	0	113	[NT]
Exchangeable Mg	meq/100g	0.1	Metals-020	<0.1	20	1.1	1.3	17	119	[NT]
Exchangeable Na	meq/100g	0.1	Metals-020	<0.1	20	0.1	0.1	0	130	[NT]

QUALITY CONTROL: Phenoxy Acid Herbicides in Soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	292364-1
Date extracted	-			06/04/2022	5	06/04/2022	06/04/2022		06/04/2022	06/04/2022
Date analysed	-			06/04/2022	5	06/04/2022	06/04/2022		06/04/2022	06/04/2022
Clopyralid	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	78	94
3,5-Dichlorobenzoic acid	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
o-chlorophenoxy acetic acid	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
4-CPA	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Dicamba	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
MCPP	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
MCPA	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Dichlorprop	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
2,4-D	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	66	81
Bromoxynil	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Triclopyr	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
2,4,5-TP	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
2,4,5-T	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	88	98
MCPB	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Dinoseb	mg/kg	1	Ext-054	<1	5	<1	<1	0	[NT]	[NT]
2,4-DB	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Ioxynil	mg/kg	1	Ext-054	<1	5	<1	<1	0	[NT]	[NT]
Picloram	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
DCPA (Chlorthal) Diacid	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Acifluorfen	mg/kg	2	Ext-054	<2	5	<2	<2	0	[NT]	[NT]
2,4,6-T	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
2,6-D	mg/kg	0.5	Ext-054	<0.5	5	<0.5	<0.5	0	[NT]	[NT]
Surrogate 2.4- DCPA	%		Ext-054	100	5	100	100	0	98	102

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

Factual description of asbestos identified in the soil samples: NEPM
Sample 292364-6; Chrysotile, Amosite and Crocidolite asbestos identified in 0.0131g of fibrous matted material

Sample 292364-27; Amosite asbestos identified in 0.0013g of loose fibre bundles

Phenoxy Acid Herbicides analysed by Envirolab Services Melbourne. Report No. 30746

TRH Soil C10-C40 NEPM - # Percent recovery for the surrogate / matrix spike is not possible to report as the high concentration of analytes in sample 292364-14,22 have caused interference.

OC's in Soil - The PQL has been raised due to interferences from analytes (other than those being tested) in sample 292364-23.

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No: 85749.02	**Suburb:** Warriewood		**To:** *Envirolab Services*
Project Manager: Kurt Plambeck	**Order Number:**	**Sampler:**	*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 3a	nitrate and phosphate	herbicides	asbestos 500 ml	CEC pH	BTEX	combo 8	combo 3			Notes/ Preservation/ Additional Requirements
1	BH1	0	0.1	29/03/22					X	X	X	X		X				
2	BH1	0.4	0.5	29/03/22											X			
3	BH2	0	0.1	29/03/22			X											
4	BH2	(0.9	1)	29/03/22											X			
5	BH3	0	0.1	29/03/22			X		X	X								
6	BH4	0	0.1	29/03/22							X			X				
7	TP5	0	0.1	30/03/22				X										
8	TP5	0.4	0.5	30/03/22							X			X				
9	TP6	0	0.1	30/03/22			X		X									
10	TP7	0	0.1	30/03/22					X	X	X	X		X				
11	TP7	0.4	0.5	30/03/22				X										
12	TP7	1.4	1.5	30/03/22				X										
13	TP8	0	0.1	30/03/22							X			X				
14	TP9	0	0.1	30/03/22			X											

Metals to analyse:			**LAB RECEIPT** 292364
Number of samples in container:	**Transported to laboratory by:**		**Lab Ref. No:**
Send results to: Douglas Partners Pty Ltd			**Received by:** ELS
Address: 96 Hermitage Road, West Ryde NSW 2114	**Phone:** (02) 9809 0666		**Date & Time:** 31 3 22 @ 1830
Relinquished by:	**Date:**	**Signed:**	**Signed:**

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	85749.02	**Suburb:**	Warriewood	**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 3a	nitrate and phosphate	herbicides	asbestos 500 ml	CEC pH	BTEX	combo 8	combo 3	BTEX		
15	TP9	0.4	0.5	30/03/22							X				X			
16	TP10	0	0.1	30/03/22					X	X	X				X			
17	TP10	0.3	0.4	30/03/22			X											
18	TP11	0	0.1	30/03/22			X											
19	TP12	0	0.1	30/03/22				X										
20	TP12	0.2	0.3	30/03/22					X	X	X	X		X				
21	TP12	0.4	0.5	30/03/22				X										
22	TP13	0	0.1	30/03/22				X										
23	TP13	0.4	0.5	30/03/22							X			X				
24	TP13	0.9	1	30/03/22			X											
25	TP14	0	0.1	30/03/22			X		X	X								
26	TP14	0.4	0.5	30/03/22				X										
27	TP15	0	0.1	30/03/22					X		X			X				
28	TP15	0.4	0.5	30/03/22				X										
29	spike			30/03/22												X		
30	blank			30/03/22												X		
31	BD02			30/03/22											X			2912364
32	BD03			30/03/22											X			

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	85749.02, Warriewood
Envirolab Reference	292364
Date Sample Received	31/03/2022
Date Instructions Received	31/03/2022
Date Results Expected to be Reported	08/04/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	32 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12
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	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Misc Soil - Inorg	Asbestos ID - soils	Asbestos ID - soils NEPM	Misc Inorg - Soil	CEC	Phenoxy Acid Herbicidesin Soil
BH1-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
BH1-0.4-0.5	✓	✓	✓				✓						
BH2-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓				
BH2-0.4-0.5	✓	✓	✓				✓						
BH3-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓
BH4-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓		✓			
TP5-0-0.1	✓	✓	✓				✓		✓				
TP5-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓		✓			
TP6-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		
TP7-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
TP7-0.4-0.5	✓	✓	✓				✓		✓				
TP7-1.4-1.5	✓	✓	✓				✓		✓				
TP8-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓		✓			
TP9-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓				
TP9-0.4-0.5	✓	✓	✓				✓			✓			
TP10-0-0.1	✓	✓	✓				✓			✓	✓		✓
TP10-0.3-0.4	✓	✓	✓	✓	✓	✓	✓	✓	✓				
TP11-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓				
TP12-0-0.1	✓	✓	✓				✓		✓				
TP12-0.2-0.3	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
TP12-0.4-0.5	✓	✓	✓				✓		✓				
TP13-0-0.1	✓	✓	✓				✓		✓				
TP13-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	✓		✓			
TP13-0.9-1	✓	✓	✓	✓	✓	✓	✓	✓	✓				
TP14-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓
TP14-0.4-0.5	✓	✓	✓				✓		✓				
TP15-0-0.1	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓		
TP15-0.4-0.5	✓	✓	✓				✓		✓				
Spike	✓												
Blank	✓												
BD02	✓	✓	✓				✓						
BD03	✓	✓	✓				✓						

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

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Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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CERTIFICATE OF ANALYSIS 292364-A

Client Details

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

Sample Details

Your Reference	**85749.02, Warriewood**
Number of Samples	additional analysis
Date samples received	31/03/2022
Date completed instructions received	11/04/2022

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.

Report Details

Date results requested by	20/04/2022
Date of Issue	14/04/2022

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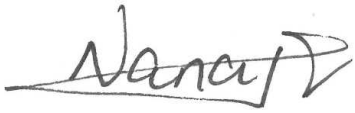
Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

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

Authorised By



Nancy Zhang, Laboratory Manager

sTPH in Soil (C10-C40)-Silica		
Our Reference		292364-A-14
Your Reference	UNITS	TP9
Depth		0-0.1
Date Sampled		30/03/2022
Type of sample		Soil
Date extracted	-	13/04/2022
Date analysed	-	13/04/2022
TPH C_{10} - C_{14}	mg/kg	910
TPH C_{15} - C_{28}	mg/kg	5,400
TPH C_{29} - C_{36}	mg/kg	3,700
TPH >C_{10} -C_{16}	mg/kg	710
TPH >C_{16} -C_{34}	mg/kg	8,600
TPH >C_{34} -C_{40}	mg/kg	1,500
Surrogate o-Terphenyl	%	102

Metals from Leaching Fluid pH 2.9 or 5		
Our Reference		292364-A-6
Your Reference	UNITS	BH4
Depth		0-0.1
Date Sampled		29/03/2022
Type of sample		Soil
Date extracted	-	12/04/2022
Date analysed	-	12/04/2022
pH of soil for fluid# determ.	pH units	7.6
pH of soil TCLP (after HCl)	pH units	1.6
Extraction fluid used		1
pH of final Leachate	pH units	5.0
Lead	mg/L	0.60

Method ID	Methodology Summary
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.
Metals-020	Determination of various metals by ICP-AES following buffer determination as per USEPA 1311 and hence AS 4439.3. Extraction Fluid 1 refers to the pH 5.0 buffer and Extraction Fluid 2 is the pH 2.9 buffer.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.

QUALITY CONTROL: sTPH in Soil (C10-C40)-Silica					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			13/04/2022	[NT]	[NT]	[NT]	[NT]	13/04/2022	[NT]
Date analysed	-			13/04/2022	[NT]	[NT]	[NT]	[NT]	13/04/2022	[NT]
TPH C_{10} - C_{14}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	83	[NT]
TPH C_{15} - C_{28}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	82	[NT]
TPH C_{29} - C_{36}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	94	[NT]
TPH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	83	[NT]
TPH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	82	[NT]
TPH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	94	[NT]
Surrogate o-Terphenyl	%		Org-020	98	[NT]	[NT]	[NT]	[NT]	83	[NT]

QUALITY CONTROL: Metals from Leaching Fluid pH 2.9 or 5					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			12/04/2022	[NT]	[NT]	[NT]	[NT]	12/04/2022	[NT]
Date analysed	-			12/04/2022	[NT]	[NT]	[NT]	[NT]	12/04/2022	[NT]
Lead	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	106	[NT]

Result Definitions

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

Quality Control Definitions

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

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

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

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

Laboratory Acceptance Criteria

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

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

Spikes for Physical and Aggregate Tests are not applicable.

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

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

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

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

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

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

Measurement Uncertainty estimates are available for most tests upon request.

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

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

Ming To

Subject: FW: Results for Registration 292364 85749.02, Warriewood

Ref: 292364-A
TAT: Standard
Due: 20/04/2022
MT.

292364-A

From: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Sent: Monday, 11 April 2022 10:48 AM
To: Nick Sarlamis <NSarlamis@envirolab.com.au>
Cc: Simon Song <SSong@envirolab.com.au>
Subject: RE: Results for Registration 292364 85749.02, Warriewood

Hi Nick,

Can you please run the following additional analysis

(14) TP9/0-0.1 silica clean up TPH
(6) BH4/0-0.1 TCLP Lead

Thanks

Kurt Plambeck | Senior Associate/Environmental Scientist
Douglas Partners Pty Ltd | ABN 75 053 980 117 | www.douglaspartners.com.au
96 Hermitage Road West Ryde NSW 2114 | PO Box 472 West Ryde NSW 1685
P: 02 9809 0666 | M: +61 402 057 147 | E: kurt.plambeck@douglaspartners.com.au

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

From: Nick Sarlamis <NSarlamis@envirolab.com.au>
Sent: Friday, 8 April 2022 5:29 PM
To: Kurt Plambeck <kurt.plambeck@douglaspartners.com.au>
Subject: Results for Registration 292364 85749.02, Warriewood

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

Please note that a hard copy will not be posted.

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	85749.02, Warriewood
Envirolab Reference	292364-A
Date Sample Received	31/03/2022
Date Instructions Received	11/04/2022
Date Results Expected to be Reported	20/04/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	additional analysis
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	12
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

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

Analysis Underway, details on the following page:

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

Sample ID	sTPH in Soil (C10-C40)-Silica	pH of soil for fluid#determ.	pH of soil TCLP (after HCl)	Extraction fluid used	pH of final Leachate	Lead	On Hold
BH1-0-0.1							✓
BH1-0.4-0.5							✓
BH2-0-0.1							✓
BH2-0.4-0.5							✓
BH3-0-0.1							✓
BH4-0-0.1		✓	✓	✓	✓	✓	
TP5-0-0.1							✓
TP5-0.4-0.5							✓
TP6-0-0.1							✓
TP7-0-0.1							✓
TP7-0.4-0.5							✓
TP7-1.4-1.5							✓
TP8-0-0.1							✓
TP9-0-0.1	✓						
TP9-0.4-0.5							✓
TP10-0-0.1							✓
TP10-0.3-0.4							✓
TP11-0-0.1							✓
TP12-0-0.1							✓
TP12-0.2-0.3							✓
TP12-0.4-0.5							✓
TP13-0-0.1							✓
TP13-0.4-0.5							✓
TP13-0.9-1							✓
TP14-0-0.1							✓
TP14-0.4-0.5							✓
TP15-0-0.1							✓
TP15-0.4-0.5							✓
Spike							✓
Blank							✓
BD02							✓
BD03							✓

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

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

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	: **ES2211362**	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	: 85749.02	Date Samples Received	: 31-Mar-2022 17:20
Order number	: ----	Date Analysis Commenced	: 04-Apr-2022
C-O-C number	: ----	Issue Date	: 08-Apr-2022 12:19
Sampler	: ----		
Site	: Warriewood		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Accreditation Category*
Ankit Joshi	Senior Chemist - Inorganics	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney 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.
- EP068: Where reported, Total Chlordane (sum) is the sum of the reported concentrations of cis-Chlordane and trans-Chlordane at or above the LOR.
- EP068: Where reported, Total OCP is the sum of the reported concentrations of all Organochlorine Pesticides at or above 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	----	----	----	----
				Sampling date / time	29-Mar-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2211362-001	--------	--------	--------	--------
					Result	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		**18.1**	----	----	----	----
EG005(ED093)T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg		**3**	----	----	----	----
Copper	7440-50-8	5	mg/kg		**8**	----	----	----	----
Lead	7439-92-1	5	mg/kg		**16**	----	----	----	----
Nickel	7440-02-0	2	mg/kg		<2	----	----	----	----
Zinc	7440-66-6	5	mg/kg		**48**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	----	----	----	----
EP068A: Organochlorine Pesticides (OC)									
alpha-BHC	319-84-6	0.05	mg/kg		<0.05	----	----	----	----
Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg		<0.05	----	----	----	----
beta-BHC	319-85-7	0.05	mg/kg		<0.05	----	----	----	----
gamma-BHC	58-89-9	0.05	mg/kg		<0.05	----	----	----	----
delta-BHC	319-86-8	0.05	mg/kg		<0.05	----	----	----	----
Heptachlor	76-44-8	0.05	mg/kg		<0.05	----	----	----	----
Aldrin	309-00-2	0.05	mg/kg		<0.05	----	----	----	----
Heptachlor epoxide	1024-57-3	0.05	mg/kg		<0.05	----	----	----	----
^ Total Chlordane (sum)	----	0.05	mg/kg		<0.05	----	----	----	----
trans-Chlordane	5103-74-2	0.05	mg/kg		<0.05	----	----	----	----
alpha-Endosulfan	959-98-8	0.05	mg/kg		<0.05	----	----	----	----
cis-Chlordane	5103-71-9	0.05	mg/kg		<0.05	----	----	----	----
Dieldrin	60-57-1	0.05	mg/kg		<0.05	----	----	----	----
4.4`-DDE	72-55-9	0.05	mg/kg		<0.05	----	----	----	----
Endrin	72-20-8	0.05	mg/kg		<0.05	----	----	----	----
beta-Endosulfan	33213-65-9	0.05	mg/kg		<0.05	----	----	----	----
^ Endosulfan (sum)	115-29-7	0.05	mg/kg		<0.05	----	----	----	----
4.4`-DDD	72-54-8	0.05	mg/kg		<0.05	----	----	----	----
Endrin aldehyde	7421-93-4	0.05	mg/kg		<0.05	----	----	----	----
Endosulfan sulfate	1031-07-8	0.05	mg/kg		<0.05	----	----	----	----
4.4`-DDT	50-29-3	0.2	mg/kg		<0.2	----	----	----	----
Endrin ketone	53494-70-5	0.05	mg/kg		<0.05	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BD01	----	----	----	----
				Sampling date / time	29-Mar-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2211362-001	--------	--------	--------	--------
					Result	----	----	----	----
EP068A: Organochlorine Pesticides (OC) - Continued									
Methoxychlor	72-43-5	0.2	mg/kg		<0.2	----	----	----	----
^ **Sum of Aldrin + Dieldrin**	309-00-2/60-57-1	0.05	mg/kg		<0.05	----	----	----	----
^ **Sum of DDD + DDE + DDT**	72-54-8/72-55-9/50-2	0.05	mg/kg		<0.05	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg		<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg		<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg		<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg		<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg		<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg		<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg		<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg		<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg		<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg		<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg		<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg		<0.5	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (zero)**	----	0.5	mg/kg		<0.5	----	----	----	----
^ **Benzo(a)pyrene TEQ (half LOR)**	----	0.5	mg/kg		**0.6**	----	----	----	----
^ **Benzo(a)pyrene TEQ (LOR)**	----	0.5	mg/kg		**1.2**	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		<100	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		<10	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Sample ID	BD01	----	----	----	----
				Sampling date / time	29-Mar-2022 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES2211362-001	--------	--------	--------	--------
					Result	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
>C10 - C16 Fraction	----	50	mg/kg		<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		<50	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		<50	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		<0.2	----	----	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP068S: Organochlorine Pesticide Surrogate									
Dibromo-DDE	21655-73-2	0.05	%		**65.6**	----	----	----	----
EP068T: Organophosphorus Pesticide Surrogate									
DEF	78-48-8	0.05	%		**84.7**	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	0.5	%		**98.1**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.5	%		**96.1**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.5	%		**76.6**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	0.5	%		**95.3**	----	----	----	----
Anthracene-d10	1719-06-8	0.5	%		**97.6**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.5	%		**86.9**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	0.2	%		**87.1**	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		**102**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		**97.4**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP068S: Organochlorine Pesticide Surrogate			
Dibromo-DDE	21655-73-2	49	147
EP068T: Organophosphorus Pesticide Surrogate			
DEF	78-48-8	35	143
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	: **ES2211362**	Page	: 1 of 9
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	: 85749.02	Date Samples Received	: 31-Mar-2022
Order number	: ----	Date Analysis Commenced	: 04-Apr-2022
C-O-C number	: ----	Issue Date	: 08-Apr-2022
Sampler	: ----		
Site	: Warriewood		
Quote number	: EN/222		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

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

This 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: 4269469)									
ES2211028-004	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	2	3	0.0	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	<5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	9	15	53.6	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	6	14	74.7	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	25	45	56.1	No Limit
ES2211489-001	Anonymous	EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.0	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	95	99	4.0	0% - 20%
		EG005T: Nickel	7440-02-0	2	mg/kg	76	68	9.9	0% - 20%
		EG005T: Arsenic	7440-38-2	5	mg/kg	<5	5	0.0	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	27	24	10.4	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	10	12	19.3	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	33	28	17.6	No Limit
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 4269474)									
ES2211292-001	Anonymous	EA055: Moisture Content	----	0.1	%	57.0	57.3	0.5	0% - 20%
ES2211489-010	Anonymous	EA055: Moisture Content	----	0.1	%	17.7	18.2	2.7	0% - 50%
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 4269470)									
ES2211028-004	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
ES2211489-001	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.0	No Limit
EP068A: Organochlorine Pesticides (OC) (QC Lot: 4262373)									
ES2211380-001	Anonymous	EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	<0.05	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 (%)*
EP068A: Organochlorine Pesticides (OC) (QC Lot: 4262373) - continued									
ES2211380-001	Anonymous	EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	<0.05	0.0	No Limit
		EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 4262371)									
ES2211380-006	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	0.6	0.7	16.8	No Limit
		EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	0.6	0.8	17.2	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	0.6	24.7	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	0.6	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	1.7	2.7	45.5	No Limit
		EP075(SIM): Benzo(a)pyrene TEQ (zero)	----	0.5	mg/kg	<0.5	0.7	27.6	No Limit
ES2211380-001	Anonymous	EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QC Lot: 4262371) - continued									
ES2211380-001	Anonymous	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: 4262372)									
ES2211380-006	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
ES2211380-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 4265678)									
ES2211489-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
ES2211489-020	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4262372)									
ES2211380-006	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
ES2211380-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.0	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.0	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 4265678)									
ES2211489-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit
ES2211489-020	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.0	No Limit

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
EP080: BTEXN (QC Lot: 4265678)									
ES2211489-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.0	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.0	No Limit
		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
ES2211489-020	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: 4269469)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	121.1 mg/kg	102	88.0	113
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	0.74 mg/kg	104	70.0	130
EG005T: Chromium	7440-47-3	2	mg/kg	<2	19.6 mg/kg	120	68.0	132
EG005T: Copper	7440-50-8	5	mg/kg	<5	52.9 mg/kg	107	89.0	111
EG005T: Lead	7439-92-1	5	mg/kg	<5	60.8 mg/kg	104	82.0	119
EG005T: Nickel	7440-02-0	2	mg/kg	<2	15.3 mg/kg	108	80.0	120
EG005T: Zinc	7440-66-6	5	mg/kg	<5	139.3 mg/kg	97.2	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4269470)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.087 mg/kg	87.9	70.0	125
EP068A: Organochlorine Pesticides (OC) (QCLot: 4262373)								
EP068: alpha-BHC	319-84-6	0.05	mg/kg	<0.05	0.5 mg/kg	84.1	69.0	113
EP068: Hexachlorobenzene (HCB)	118-74-1	0.05	mg/kg	<0.05	0.5 mg/kg	81.0	65.0	117
EP068: beta-BHC	319-85-7	0.05	mg/kg	<0.05	0.5 mg/kg	89.5	67.0	119
EP068: gamma-BHC	58-89-9	0.05	mg/kg	<0.05	0.5 mg/kg	87.1	68.0	116
EP068: delta-BHC	319-86-8	0.05	mg/kg	<0.05	0.5 mg/kg	83.6	65.0	117
EP068: Heptachlor	76-44-8	0.05	mg/kg	<0.05	0.5 mg/kg	82.8	67.0	115
EP068: Aldrin	309-00-2	0.05	mg/kg	<0.05	0.5 mg/kg	86.0	69.0	115
EP068: Heptachlor epoxide	1024-57-3	0.05	mg/kg	<0.05	0.5 mg/kg	91.0	62.0	118
EP068: trans-Chlordane	5103-74-2	0.05	mg/kg	<0.05	0.5 mg/kg	91.0	63.0	117
EP068: alpha-Endosulfan	959-98-8	0.05	mg/kg	<0.05	0.5 mg/kg	90.2	66.0	116
EP068: cis-Chlordane	5103-71-9	0.05	mg/kg	<0.05	0.5 mg/kg	93.0	64.0	116
EP068: Dieldrin	60-57-1	0.05	mg/kg	<0.05	0.5 mg/kg	91.2	66.0	116
EP068: 4.4`-DDE	72-55-9	0.05	mg/kg	<0.05	0.5 mg/kg	88.0	67.0	115
EP068: Endrin	72-20-8	0.05	mg/kg	<0.05	0.5 mg/kg	77.5	67.0	123
EP068: beta-Endosulfan	33213-65-9	0.05	mg/kg	<0.05	0.5 mg/kg	92.5	69.0	115
EP068: 4.4`-DDD	72-54-8	0.05	mg/kg	<0.05	0.5 mg/kg	89.3	69.0	121
EP068: Endrin aldehyde	7421-93-4	0.05	mg/kg	<0.05	0.5 mg/kg	96.0	56.0	120
EP068: Endosulfan sulfate	1031-07-8	0.05	mg/kg	<0.05	0.5 mg/kg	86.1	62.0	124
EP068: 4.4`-DDT	50-29-3	0.2	mg/kg	<0.2	0.5 mg/kg	78.2	66.0	120
EP068: Endrin ketone	53494-70-5	0.05	mg/kg	<0.05	0.5 mg/kg	92.8	64.0	122
EP068: Methoxychlor	72-43-5	0.2	mg/kg	<0.2	0.5 mg/kg	77.8	54.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4262371)								
EP075(SIM): Naphthalene	91-20-3	0.5	mg/kg	<0.5	6 mg/kg	98.5	77.0	125
EP075(SIM): Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	6 mg/kg	98.1	72.0	124

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
				Result	Concentration	LCS	Low	High
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4262371) - continued								
EP075(SIM): Acenaphthene	83-32-9	0.5	mg/kg	<0.5	6 mg/kg	99.5	73.0	127
EP075(SIM): Fluorene	86-73-7	0.5	mg/kg	<0.5	6 mg/kg	102	72.0	126
EP075(SIM): Phenanthrene	85-01-8	0.5	mg/kg	<0.5	6 mg/kg	102	75.0	127
EP075(SIM): Anthracene	120-12-7	0.5	mg/kg	<0.5	6 mg/kg	91.2	77.0	127
EP075(SIM): Fluoranthene	206-44-0	0.5	mg/kg	<0.5	6 mg/kg	96.6	73.0	127
EP075(SIM): Pyrene	129-00-0	0.5	mg/kg	<0.5	6 mg/kg	95.8	74.0	128
EP075(SIM): Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	6 mg/kg	106	69.0	123
EP075(SIM): Chrysene	218-01-9	0.5	mg/kg	<0.5	6 mg/kg	107	75.0	127
EP075(SIM): Benzo(b+j)fluoranthene	205-99-2 205-82-3	0.5	mg/kg	<0.5	6 mg/kg	97.8	68.0	116
EP075(SIM): Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	6 mg/kg	96.3	74.0	126
EP075(SIM): Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	6 mg/kg	96.2	70.0	126
EP075(SIM): Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	6 mg/kg	102	61.0	121
EP075(SIM): Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	6 mg/kg	103	62.0	118
EP075(SIM): Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	6 mg/kg	96.5	63.0	121
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4262372)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	300 mg/kg	103	75.0	129
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	450 mg/kg	111	77.0	131
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	300 mg/kg	108	71.0	129
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4265678)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	26 mg/kg	80.8	68.4	128
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4262372)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	375 mg/kg	98.5	77.0	125
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	525 mg/kg	109	74.0	138
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	225 mg/kg	101	63.0	131
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4265678)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	31 mg/kg	83.4	68.4	128
EP080: BTEXN (QCLot: 4265678)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	98.8	62.0	116
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	104	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	101	66.0	118
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	101	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**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005(ED093)T: Total Metals by ICP-AES (QCLot: 4269469)							
ES2211028-004	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	80.8	70.0	130
		EG005T: Cadmium	7440-43-9	50 mg/kg	75.8	70.0	130
		EG005T: Copper	7440-50-8	250 mg/kg	83.5	70.0	130
		EG005T: Lead	7439-92-1	250 mg/kg	76.4	70.0	130
		EG005T: Nickel	7440-02-0	50 mg/kg	70.0	70.0	130
		EG005T: Zinc	7440-66-6	250 mg/kg	73.1	66.0	133
EG035T: Total Recoverable Mercury by FIMS (QCLot: 4269470)							
ES2211028-004	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	91.6	70.0	130
EP068A: Organochlorine Pesticides (OC) (QCLot: 4262373)							
ES2211380-001	Anonymous	EP068: gamma-BHC	58-89-9	0.5 mg/kg	82.6	70.0	130
		EP068: Heptachlor	76-44-8	0.5 mg/kg	77.3	70.0	130
		EP068: Aldrin	309-00-2	0.5 mg/kg	80.8	70.0	130
		EP068: Dieldrin	60-57-1	0.5 mg/kg	82.0	70.0	130
		EP068: Endrin	72-20-8	2 mg/kg	80.9	70.0	130
		EP068: 4.4`-DDT	50-29-3	2 mg/kg	83.4	70.0	130
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons (QCLot: 4262371)							
ES2211380-001	Anonymous	EP075(SIM): Acenaphthene	83-32-9	10 mg/kg	115	70.0	130
		EP075(SIM): Pyrene	129-00-0	10 mg/kg	105	70.0	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4262372)							
ES2211380-001	Anonymous	EP071: C10 - C14 Fraction	----	480 mg/kg	104	73.0	137
		EP071: C15 - C28 Fraction	----	3100 mg/kg	114	53.0	131
		EP071: C29 - C36 Fraction	----	2060 mg/kg	118	52.0	132
EP080/071: Total Petroleum Hydrocarbons (QCLot: 4265678)							
ES2211489-001	Anonymous	EP080: C6 - C9 Fraction	----	32.5 mg/kg	89.3	70.0	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4262372)							
ES2211380-001	Anonymous	EP071: >C10 - C16 Fraction	----	860 mg/kg	97.2	73.0	137
		EP071: >C16 - C34 Fraction	----	4320 mg/kg	118	53.0	131
		EP071: >C34 - C40 Fraction	----	890 mg/kg	124	52.0	132
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 4265678)							
ES2211489-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	37.5 mg/kg	90.2	70.0	130
EP080: BTEXN (QCLot: 4265678)							
ES2211489-001	Anonymous	EP080: Benzene	71-43-2	2.5 mg/kg	87.3	70.0	130
		EP080: Toluene	108-88-3	2.5 mg/kg	91.4	70.0	130
		EP080: Ethylbenzene	100-41-4	2.5 mg/kg	91.6	70.0	130

Sub-Matrix: **SOIL**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EP080: BTEXN (QCLot: 4265678) - continued							
ES2211489-001	Anonymous	EP080: meta- & para-Xylene	108-38-3 106-42-3	2.5 mg/kg	90.9	70.0	130
		EP080: ortho-Xylene	95-47-6	2.5 mg/kg	90.8	70.0	130
		EP080: Naphthalene	91-20-3	2.5 mg/kg	81.3	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **ES2211362**	Page	: 1 of 4
Client	: **DOUGLAS PARTNERS PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: MR KURT PLAMBECK	Telephone	: +61 2 8784 8555
Project	: 85749.02	Date Samples Received	: 31-Mar-2022
Site	: Warriewood	Issue Date	: 08-Apr-2022
Sampler	: ----	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

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

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

Summary of Outliers

Outliers : Quality Control Samples

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

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

Outliers : Analysis Holding Time Compliance

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

Outliers : Frequency of Quality Control Samples

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

Analysis Holding Time Compliance

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

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

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

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

Matrix: **SOIL**

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

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055)							
BD01	**29-Mar-2022**	**----**	----	----	**05-Apr-2022**	12-Apr-2022	✓
EG005(ED093)T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T)							
BD01	**29-Mar-2022**	**06-Apr-2022**	25-Sep-2022	✓	**06-Apr-2022**	25-Sep-2022	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T)							
BD01	**29-Mar-2022**	**06-Apr-2022**	26-Apr-2022	✓	**06-Apr-2022**	26-Apr-2022	✓
EP068A: Organochlorine Pesticides (OC)							
Soil Glass Jar - Unpreserved (EP068)							
BD01	**29-Mar-2022**	**04-Apr-2022**	12-Apr-2022	✓	**06-Apr-2022**	14-May-2022	✓
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons							
Soil Glass Jar - Unpreserved (EP075(SIM))							
BD01	**29-Mar-2022**	**04-Apr-2022**	12-Apr-2022	✓	**06-Apr-2022**	14-May-2022	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP080)							
BD01	**29-Mar-2022**	**04-Apr-2022**	12-Apr-2022	✓	**04-Apr-2022**	12-Apr-2022	✓
Soil Glass Jar - Unpreserved (EP071)							
BD01	**29-Mar-2022**	**04-Apr-2022**	12-Apr-2022	✓	**05-Apr-2022**	14-May-2022	✓
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions							
Soil Glass Jar - Unpreserved (EP080)							
BD01	**29-Mar-2022**	**04-Apr-2022**	12-Apr-2022	✓	**04-Apr-2022**	12-Apr-2022	✓
Soil Glass Jar - Unpreserved (EP071)							
BD01	**29-Mar-2022**	**04-Apr-2022**	12-Apr-2022	✓	**05-Apr-2022**	14-May-2022	✓
EP080: BTEXN							
Soil Glass Jar - Unpreserved (EP080)							
BD01	**29-Mar-2022**	**04-Apr-2022**	12-Apr-2022	✓	**04-Apr-2022**	12-Apr-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	2	20	**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
Pesticides by GCMS	EP068	1	7	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	20	**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	17	**11.76**	**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
Pesticides by GCMS	EP068	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**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	17	**5.88**	**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
Pesticides by GCMS	EP068	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**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	17	**5.88**	**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
Pesticides by GCMS	EP068	1	7	**14.29**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	20	**5.00**	**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	17	**5.88**	**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)
Pesticides by GCMS	EP068	SOIL	In house: Referenced to USEPA SW 846 - 8270 Extracts are analysed by Capillary GC/MS and quantification is by comparison against an established 5 point calibration curve. This technique 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.

Douglas Partners
Geotechnics | Environment | Groundwater

CHAIN OF CUSTODY DESPATCH SHEET

Project No:	85749.02	**Suburb:**	Warriewood	**To:**	*ALS*
Project Manager:	Kurt Plambeck	**Order Number:**		**Sampler:**	
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	Sample ID: Depth From	Sample ID: Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: 8 metals	BTEX	PAH	TRH	OCP							Notes/ Preservation/ Additional Requirements
1	BD01			29/3/22.			X	X	X	X	X							

Environmental Division
Sydney
Work Order Reference
ES2211362

Telephone : +61-2-8784 8555

Metals to analyse:			
Number of samples in container:		**Transported to laboratory by:**	
Send results to:	Douglas Partners Pty Ltd		
Address:	96 Hermitage Road, West Ryde NSW 2114	**Phone:** (02) 9809 0666	
Relinquished by:	KP 31/3 11am.	**Date:**	**Signed:**

LAB RECEIPT	
Lab Ref. No:	
Received by:	SC
Date & Time:	31/3/22 1720
Signed:	ALS

Appendix I

Quality Assurance / Quality Control

Appendix I
Quality Assurance / Quality Control
10-12 Boondah Road, Warriewood

1.0 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 the summary results QA1 to QA2.

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 Table QA1	5% 10% of primary samples; <30% RPD	PC
Inter-laboratory replicates Table QA2	5% of primary samples; <30% RPD	C
Trip Spikes Table QA3	1 per sampling event; 60-140% recovery	C
Trip Blanks Table QA4	1 per sampling event; <PQL	C
Laboratory / Reagent Blanks	1 per batch; <PQL	C
Laboratory Duplicate	1 per lab batch; As laboratory certificate	C
Matrix Spikes	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Surrogate Spikes	All organics analysis; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Control Samples	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Standard Operating Procedures (SOP)	Adopting SOP for all aspects of the sampling field work	C

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

The RPD results were all within the acceptable range, with the exception of those indicated in Tables QA1 and QA2. The exceedances are not, however, considered to be of concern given that:

- The typically low actual differences in the concentrations of the replicate pairs where some RPD exceedances occurred;
- The 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.

Table QA1: Intra-laboratory Duplicates

		BD02	TP6			BD03	TP11		
		0 m	0 - 0.1 m	Difference	RPD	0 m	0 - 0.1 m	Difference	RPD
Metals	Arsenic	8	15	7	**61%**	<4	4	0	0%
	Cadmium	<0.4	<0.4	0	0%	<0.4	<0.4	0	0%
	Total Chromium	4	7	3	**55%**	4	6	2	**40%**
	Copper	4	7	3	**55%**	4	8	4	**67%**
	Lead	5	8	3	**46%**	17	21	4	21%
	Mercury (inorganic)	<0.1	<0.1	0	0%	<0.1	<0.1	0	0%
	Nickel	1	2	1	**67%**	1	2	1	**67%**
	Zinc	18	36	18	**67%**	32	47	15	**38%**
TRH	TRH C6 - C10	<25	<25	0	0%	<25	<25	0	0%
	TRH >C10-C16	<50	<50	0	0%	<50	<50	0	0%
	F1 ((C6-C10)-BTEX)	<25	<25	0	0%	<25	<25	0	0%
	F2 (>C10-C16 less Naphthalene)	<50	<50	0	0%	<50	<50	0	0%
	F3 (>C16-C34)	<100	<100	0	0%	160	210	50	27%
	F4 (>C34-C40)	<100	<100	0	0%	<100	<100	0	0%
BTEX	Benzene	<0.2	<0.2	0	0%	<0.2	<0.2	0	0%
	Toluene	<0.5	<0.5	0	0%	<0.5	<0.5	0	0%
	Ethylbenzene	<1	<1	0	0%	<1	<1	0	0%
	Total Xylenes	<1	<1	0	0%	<1	<1	0	0%
PAH	Naphthalene [b]	<0.1	<0.1	0	0%	<0.1	<0.1	0	0%

		BD02	TP6			BD03	TP11		
		0 m	0 - 0.1 m	Difference	RPD	0 m	0 - 0.1 m	Difference	RPD
	Benzo(a)pyrene (BaP)	<0.05	<0.05	0	0%	<0.05	<0.05	0	0%
	Benzo(a)pyrene TEQ	<0.5	<0.5	0	0%	<0.5	<0.5	0	0%
	Total PAHs	<0.05	<0.05	0	0%	<0.05	<0.05	0	0%

Table QA2: Inter-laboratory Duplicates

		Sample ID	BD01	BH2		
		Depth	0 m	0 - 0.1 m		
		Sample Date	29-Mar-22 15:00	29/03/2022	Difference	RPD
Metals	Arsenic	mg/kg	<5	<4	1	22%
	Cadmium	mg/kg	<1	<0.4	0	**0**
	Total Chromium	mg/kg	3	2	1	**40%**
	Copper	mg/kg	8	8	0	0%
	Lead	mg/kg	16	13	3	21%
	Mercury (inorganic)	mg/kg	<0.1	<0.1	0	0%
	Nickel	mg/kg	<2	<1	0	**0**
	Zinc	mg/kg	48	44	4	9%
TRH	TRH C6 - C10	mg/kg	<10	<25	0	**0**
	TRH >C10-C16	mg/kg	<50	<50	0	0%
	F1 ((C6-C10)-BTEX)	mg/kg	<10	<25	0	**0**
	F2 (>C10-C16 less Naphthalene)	mg/kg	<50	<50	0	0%
	F3 (>C16-C34)	mg/kg	<100	<100	0	0%
	F4 (>C34-C40)	mg/kg	<100	<100	0	0%
BTEX	Benzene	mg/kg	<0.2	<0.2	0	0%
	Toluene	mg/kg	<0.5	<0.5	0	0%
	Ethylbenzene	mg/kg	<0.5	<1	0	**0**
	Total Xylenes	mg/kg	<0.5	<1	0	**0**
PAH	Naphthalene [b]	mg/kg	<1	<0.1	0	**0**
	Benzo(a)pyrene (BaP)	mg/kg	<0.5	<0.05	0	**0**
	Benzo(a)pyrene TEQ	mg/kg	<0.5	<0.5	0	0%
OCP	DDD	mg/kg	<0.05	<0.1	0	**0**

		Sample ID	BD01	BH2		
		Depth	0 m	0 - 0.1 m		
		Sample Date	29-Mar-22 15:00	29/03/2022	Difference	RPD
	DDT+DDE+DDD [c]	mg/kg	<0.05	<0.1	0	**0**
	DDE	mg/kg	<0.05	<0.1	0	**0**
	DDT	mg/kg	<0.2	<0.1	0	**0**
	Aldrin & Dieldrin	mg/kg	<0.05	<0.1	0	**0**
	Endosulfan I	mg/kg	<0.05	<0.1	0	**0**
	Total Chlordane	mg/kg	<0.05	<0.1	0	**0**
	Endosulfan II	mg/kg	<0.05	<0.1	0	**0**
	Endosulfan Sulphate	mg/kg	<0.05	<0.1	0	**0**
	Total Endosulfan	mg/kg	<0.05	NT	-	-
	Heptachlor	mg/kg	<0.05	<0.1	0	**0**
	Hexachlorobenzene	mg/kg	<0.05	<0.1	0	**0**
	Methoxychlor	mg/kg	<0.2	<0.1	0	**0**

Table QA3: Trip Spike

Sample ID	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene
Spike	101	105	102	103	100

Table QA4: Trip Blank

Sample ID	Benzene	Toluene	Ethylbenzene	o-Xylene	m+p-Xylene
Blank	<0.2	<0.5	<1	<1	<2

2.0 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, test pit logs, sample location plan and chain of custody records.
	Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody.
	Samples analysed for contaminants of potential concern (COPC) identified in the Conceptual Site Model (CSM).
	Completion of chain of custody (COC) documentation.
	NATA accredited laboratory results certificates provided by the laboratory.
	Satisfactory frequency and results for field and laboratory quality control (QC) samples as discussed in Section 1.
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project.
	Experienced 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.

3.0 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.

4.0 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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